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Mac add-ons unveiled as Jobs departs

By Maura McEnaney

CUPERTINO, Calif. — Anticipated fanfare surrounding Apple Computer, Inc.'s introduction of its long-awaited 20M-byte hard disk and additional software and peripherals for the Macintosh computer was muffled last week when Chairman Steven Jobs angrily resigned from the firm he cofounded and helped to lead the microcomputer revolution.

Jobs resigned last week amid charges that he raided the company of five key employees with whom he planned to start an educational computer firm. When it was reported that Apple's board of directors was contemplating taking action against Chairman Jobs, Jobs insisted the board accept his resignation.

The resignation letter, which Jobs made immediately available to several newspapers, said the board of directors had taken a "hostile posture" toward him as a result of the new venture. In addition, he said, "The company's recent reorganization left me with no work to do and no access even to regular management reports."

News of the Jobs departure overshadowed last week's introduction of several key new Apple products. Among them was a 20M-byte, 3½-in. Winchester hard disk drive for which Macintosh business users have long been clamoring and which is seen as one of the peripherals the Macintosh needs to be considered a serious business tool.

"It's unfortunate the announcement has become so clouded with this soap opera," said Jan Lewis, an analyst with the Palo Alto Research Group in California. Apple's introduction of the hard disk drive was long overdue, Lewis said. "Apple had to come out with it. It couldn't go after the business market

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Washington eases AT&T computer sales strictures

Permission conditional on revenues disclosure

By Bryan Wilkins

WASHINGTON, D.C. — In the most significant deregulatory move since the divestiture of AT&T, the Federal Communications Commission last week conditionally approved AT&T's request to market its telephone and computer equipment lines together with its regulated transmission services.

The FCC said it will drop the present requirement that AT&T sell telephone and computer equipment separately through its Information Systems subsidiary. Still in effect, however, is a requirement to maintain a separate sales operation for enhanced telecommunications services like electronic mail.

As a result, AT&T will no longer be forced to maintain duplicate marketing forces in its Informations Systems and Communications subsidiaries, allowing the company to integrate its bids for large-volume corporate customers. Since deregulation, these customers have often complained about AT&T's lack of coordination when dealing with its clients.

AT&T Executive Vice-President Charles Marshall alluded to these complaints in reacting to the FCC decision. "For our customers, it will mean better service," Marshall said in a prepared statement. "Various parts of our business will be in a position to work together to offer customers a fully integrated approach to their equipment and network service needs and, where desirable, one point of contact with the company."

Marshall said 10 corporate or government accounts will be selected for service by an integrated marketing team, which

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TOP OF THE NEWS

Score another one for Lotus' campaign against unauthorized reproduction of micro software. The latest company to come clean was Computerknowledge, a Dallas-based software training organization, which late last week disclosed that it had uncovered and halted widespread illegal copying of Lotus 1-2-3 among its employees. Computerknowledge had an existing written policy prohibiting unauthorized software duplication by employees and is a member of the Association of Data Processing Service Organizations, the profesional organization that has taken the lead in combatting illegal software reproduction.

■

Cray Research, manufacturers of some of the largest computers known to man, just released an upgrade of its X-MP line offering more memory than ever before. But users are still clamoring for storage space. "We have very large memory requirements and could use any memory Cray makes available," said Steven Walworth, planning analyst at the National Aeronautics and Space Administration's Ames Research Center

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Productivity key concern at Software/Expo

By John Desmond and John Gallant

ANALYSIS

Despite all that is new in the computer industry, users at last week's Software/Expo in Dallas seemed most concerned with issues and technologies they have wrestled with for some time.

Underscoring them all, however, was a concern regarding productivity in U.S. business and the computer software industry's failure to cope effectively with this matter.

Regarding other concerns, users appeared to be still wrestling with some mundane, unglamorous issues such as controlling the massive influx of personal computers, paring the applications backlog and implementing core products like data base management systems and micro-mainframe links.

The first to address the productivity issue was keynote speaker Tom Nies, chief executive officer of Cincom Systems, Inc., the sole vendor to use the show as a springboard for a major product introduction (see story below). Nies declared that the current computer industry recession was the result of a declining rate of productivity improvement across all industries. The Cincom Systems executive placed blame for faltering productivity squarely on the shoulders of software vendors — IBM and the independents.

"The computer industry recession is primarily caused by the software vendors' old-fashioned approach to software," Nies said. "That approach makes it impossible for customers to consume new computers. It inhibits the forward movement of the computer industry."

Crediting hardware vendors with great advances, Nies said those gains have largely been negated by the software industry's evolutionary, almost snail-paced advances. "The idea of software generations is a hoax," he said. "There have been no revolutionary periods of change. There have been no great leaps and bounds."

With the failure of software to use the full potential of hardware, "we, as DP professionals, will not be able to satisfy the hoped-for revolution in DP. We won't be able to support, for example, distributed processing, real end-user computing

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Cincom DBMS out

By John Gallant

DALLAS — Serving notice to rivals that it intends to win back its "rightful place" in the data base management system market, Cincom Systems, Inc. last week introduced a relational DBMS

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NEWSPAPER

CDC losses kill bond offer

Divesting assets seen likely to stem losses, boost rating

By Clinton Wilder

MINNEAPOLIS — Control Data Corp. is facing steep losses and a potentially severe fiscal crisis in the wake of last week's 11th-hour cancellation of a $300 million public offering of bonds and preferred stock.

That is the opinion of analysts and company observers who have watched the U.S.'s fourth largest computer company flounder in a sea of unsuccessful diversification and devastated margins in the computer peripherals market. Most analysts said they believe CDC's No. 1 priority must be the continued sale of its corporate assets to raise cash for the preservation of credit arrangements with its banks.

The company had intended to use the proceeds of the offering to pay off debt issues. In recent weeks, the company announced it has fallen into technical default on covenants contained in those issues.

CDC's Commercial Credit Co. subsidiary, whose current profitability has offset some of the firm's losses in the computer business, appears to be the most likely candidate for divestiture, either as a whole or in parts. The proposed sale of the business to Security Pacific Co. was canceled in June, but Commercial Credit has restructured since then and is projected to more than triple its $25.2 million first-half profit for the full year.

By contrast, CDC's information services and products business unit, which comprises mainframes, supercomputers, peripherals and data processing and other automated services, lost $32.7 million in the first six months of 1985. Some estimates project the full-year loss for the computer unit at as high as $100 million.

"By selling off assets, it buys [the company] time to get operations under control. There are some very attractive assets within Commercial Credit," said Michael Geran of E. F. Hutton & Co.

CDC's current volatile situation was sparked Sept. 17, when underwriter Goldman, Sachs & Co. announced it would not authorize CDC's sale of $100 million in shares of depositary preferred stock and $200 million in subordinated debentures or bonds.

In addition to forcing the company to seek alternative short-term financing to replace the offering, the news rocked Wall Street's confidence in CDC's financial future. Within hours, Standard & Poor's Corp. lowered its credit ratings on the senior debt, preferred stock and commercial paper of CDC and Commercial Credit.

"If Goldman Sachs, with its reputation for integrity and thoroughness, rejected the offering, there's a lot more to CDC's situation than has been reported before," said William Shaffer, president of the Minneapolis consulting firm of Shaffer & Associates, Inc. and a veteran CDC observer. "When you add up all the indicators, it's a very serious situation."

Shaffer said customer confidence may be shaken in the company. "The scientific user community is very dependent on support. It's hard to sell in that environment without confidence in that support."

E. F. Hutton's Geran predicted CDC will pay particular attention to support to prevent further erosion of its customer base. He said the company's biggest financial drains are its peripherals and DP services businesses.

Analyst Jonathan Fram of Paine Webber, Inc. compared CDC's experience in peripherals to battered semiconductor vendors in the dynamic random-access memory chip market. Excess capacity and a wave of Japanese imports have turned the stagnated peripheral market into a cutthroat battle for market share, often regardless of price. "CDC seems to be holding its own in pricing, but the peripheral business is nothing to write home about," he said.

The investment community consensus is that CDC must accelerate its recent pattern of consolidation and divestiture to retain a fighting chance at keeping its financial ship afloat. "I think they are trying to do that," Fram said. "The sense of urgency is there."

Report to target data security

Securing data against intruders inside and outside a firm remains a high priority for MIS managers.

Computerworld's Nov. 25 Special Report, Protecting the Corporate Information Resource, will address data security problems and offer solutions for correcting them.

Article contributions are now being considered.

They should take one of two forms: a tutorial article discussing an issue or an application story outlining a user's experience.

The deadline for submissions is Sept. 25.

Articles must be typed, double-spaced and range in length from three to five pages. Artwork is welcome.

If you have a story or an opinion, contact Janet Fiderio, Special Reports Editor, *Computerworld*, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

From page 1

Washington eases AT&T computer sales structures

will be used to determine general marketing policy. He said AT&T hopes the FCC will continue removing its structural separation conditions from other parts of AT&T's business, citing in particular its enhanced service offerings, which will continue to be marketed through AT&T Information Systems.

There will be no immediate "radical reorganization, nor do we anticipate any significant new downsizing of our force because of this action," Marshall said.

Daniel J. Harrold, a Washington, D.C., attorney and spokesman for the International Communications Association (ICA), which represents large telecommunications users, reacted to the FCC's move by saying the association wants to see details of AT&T's accounting plan before making a judgment. "This is the key to lifting the separation requirements. There is obviously going to be some subsidy [of equipment sales and transmission], but the question is how much and to what degree."

In a separate move, the FCC denied AT&T Communications' request for permission to proceed with an optional discount pricing plan, Pro-America, which would have awarded users a 15% discount on all direct-dial long-distance calls for a flat $25 monthly fee. The requested tarriff was not supported by demand figures supplied by AT&T, the FCC ruled.

The FCC conditioned its permission allowing AT&T to drop the separate subsidiary requirement for the marketing of terminal and computer equipment — the heart of its Second Computer Inquiry decision policy — on AT&T moves to establish accounting procedures and network disclosure policies. The FCC will have to approve these plans before the new policy can go into effect.

First, AT&T will have an obligation to disclose to its competitors changes in technical interconnection standards to its core network at the time it is ready to make a make/buy decision. Competing equipment organizations will have to sign a nondisclosure clause if they are seeking to bid for one of AT&T's contracts. If they do not sign, AT&T must publicly disclose its planned network changes at least six months before they are to go into effect.

Second, the FCC is requiring that AT&T establish an order placement structure to prevent discrimination in the servicing of new orders coming into AT&T for connections to its dominant long-distance network and to ensure that all customers receive the same treatment. The FCC will require monthly reports on installations in this regard.

Third, the FCC will require AT&T Communications to disclose proprietary information on its customers' telecommunications installations if directed by the customer to do so. This gives the customer some power over the selection of a carrier and equipment, the ICA's Harrold said.

The fourth and final condition will require AT&T to set up a cost accounting system to track joint and common costs shared between the equipment arm and the transmission portion for AT&T's combined marketing, research and development and sales efforts.

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Two big commercial users are satisfied with AT&T's Unix but worry about the polarization among competing Unix systems/**6**

Less than a month after receiving the proposed Cobol 85 standard from its drafters, the American National Standards Institute has given its final approval/**10**

IBM unleashed software that brought its 4700 financial system into the Big Blue office architecture/**11**

Ansa Software released its Paradox relational data base management system for IBM and compatible micros/**12**

Lotus is sending out corrections for a bug in its Symphony Release 1.1 software/**13**

The U.S. Department of Justice is pushing its computer crime bill as part of a package targeted at white-collar crime/**15**

The employment levels of most leading mainframe and minicomputer vendors have shrunk or grown only moderately since the beginning of the year/**24**

Nasa is planning to use Ada, the high-level programming language, for its space station project's on-board computers/**26**

James Martin, noted author on information management, urged more automation in MIS to build a knowledge base for the corporation the future/**28**

IBM Chairman John Opel asserted that foreign governments should stop monopolizing their telecommunications networks and open them to free-market forces/**29**

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Cray doubles memory on X-MP line

By James Connolly

MINNEAPOLIS — Responding to what users described as an insatiable demand for more memory, Cray Research, Inc. last week upgraded available CPU memory on its X-MP line of supercomputers.

Cray introduced four expanded-memory X-MP models, cut the price on an existing model, discontinued another model and announced I/O products. The product line now consists of nine models, featuring various memory capacities in uniprocessor, dual-processor and four-processor versions.

The X-MP line now stretches from the previous 1M-word (using 64K-bit words) uniprocessor X-MP/11 to the new high-end X-MP model, the four-processor, 16M-word X-MP/416 that costs $16 million. While the X-MP/416 is priced just $1.6 million below the top-end Cray system — the 264M-word Cray-2 announced earlier this year — the machines are not competitors, Cray Executive Vice-President Marcelo Gumucio noted.

> ”
>
> *'We can use all of the memory we can get.'*
>
> **— John E. Ranelletti**
> **Lawrence Livermore**
> **National Laboratory**

"The Cray-2 and the X-MP are really two different machines. The Cray-2 has a [264M-word] memory but is a new machine about which we are still learning the total capability. It was designed to solve larger computational problems that can be comprehended in main memory. The X-MP is a multitasking, multiprogramming machine for which there are a lot of application packages available," Gumucio said.

Supercomputer consultant Sid Fernbach of San Jose, Calif., noted that the four-processor X-MP "is just as good a machine as the Cray-2" and that the software for the Cray-2, the second of which is scheduled for delivery to a [National Aeronautics and Space Administration] location next month, "isn't too good."

Managers interviewed last week at X-MP installations, while unfamiliar with the details of the Cray announcements, welcomed news of the memory enhancements.

"For our applications at [the Nasa Ames Research Center] we have very large memory requirements and could use any memory Cray makes available," commented Steven Walworth, planning analyst for Nasa Ames at Moffett Field, Calif.

John E. Ranelletti, head of the computation department for Lawrence Livermore National Laboratory in Livermore, Calif., added, "I'm not personally familiar with the announcement, but we can use all of the memory we can get."

The X-MP/416 moves ahead of the existing four-processor, 8M-word X-MP/48 at the top of the X-MP line. Both systems use emitter-coupled, bipolar memory technology.

The dual-processor systems announced are the X-MP/216 with a 16M-word memory and the 8M-word X-MP/28. Cray also said it is cutting the price on the 4M-word X-MP/24 from $10.5 million to $8.5 million and discontinued a 2M-word version. The fourth new processor is the X-MP/18, featuring 8M words of memory.

Cray said all dual processors and uniprocessors now will use static MOS memory technology.

The company announced that several features previously available only on the largest Cray X-MPs have been extended to all models. The features include gather/scatter and compressed index vector instructions, which allow for vectorized processing of randomly organized data, and a 1G-byte channel for connecting a Cray Solid-State Storage Device.

Cray also introduced its DD-39 1.2G-byte disk storage device, featuring a 5.9M byte/sec. transfer rate, and announced an IBM Data Streaming Interface with a 3M-byte bandwidth for data access from IBM storage devices.

Delivery for the new uniprocessor models reportedly is scheduled for the second quarter of 1986, for the new dual processors in the third quarter of 1986 and for the new four-processor models in the fourth quarter of 1986.

The X-MP/416 costs $16 million; the X-MP/216 costs $11.5 million; the X-MP/28 costs $9.5 million; and the X-MP/18 costs $8 million.

Field upgrades from uniprocessors to dual processors and from dual systems to four-processor systems are unavailable. However, memory upgrades within those systems are available for the price of the difference between models.

IBM rolls out PC Network products

IBM last week announced products for its PC Network and enhancements to its microcomputer software introduced last summer.

The PC Network Analysis Program monitors activities and identifies problem conditions on a network. The program can sample, analyze and present network operation information at user-selected levels. It monitors conditions at individual adapters and tracks traffic for specific periods of time.

The software maintains a program-created directory of powered-on adapters.

The package costs $1,295 and will be available in December.

The company also added the IBM Business Management Series Local-Area Network Access Edition. The program works with the Business Management Series, a six-package series of general ledger and accounting packages, and enables the programs to operate on the PC Network.

With the package, five concurrent users, consisting of a network server and up to four remote users, can access one of the six business packages. Users can share logs, programs and data files. The Business Management Series Local-Area Network Access Edition's applications job monitor tracks which IBM Personal Computer on a network is running the program, monitors reserved files and manages locked application files.

The software costs $245.

The IBM Local-Area Network Printmanager enables users of an IBM PC Network or a Corvus Systems, Inc. Omninet to share an IBM 3820 page printer equipped with a Synchronous Data Link Control card. A user can choose from up to 55 fonts.

The Data and Words modules of the IBM Personal Decision Series also have been enhanced. Words now includes a facility that converts documents so they can be used by IBM's Displaywrite 1, 2 or 3. A second change improves the package's interface to Word Proof spelling checker. The Data module now supports the installation of Displaywrite 1, 2 or 3.

The firm also introduced a C compiler that runs under IBM's PC-DOS 3.1. The compiler features include selectable-memory-model support.

The compiler sells for $495.

Second-class postage paid at Framingham, Mass., and additional mailing offices.

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From page 1

Macintosh add-on products unveiled as Jobs departs

without having a hard disk drive," according to Lewis.

Hard Disk 20 fits underneath and connects to the back of the Macintosh and can be used with any Mac with 512K bytes of memory. It is the second hard disk drive to be introduced for the Macintosh in recent months. General Computers, Inc. of Cambridge, Mass., introduced a 20M-byte hard disk for the Macintosh last month in Boston.

Scheduled for limited availability in November, the Hard Disk 20 can operate twice as fast as a floppy disk drive, a spokesman said. Hard Disk 20 comes with a hierarchical filing system, and the software uses the Macintosh's file folder icons for grouping together related files, a spokesman said.

The product costs $1,499.

Apple also introduced a version of its dot matrix printer. Imagewriter II, priced at $595, can operate at up to 250 char./sec. and gives users access to three printing modes.

The printer is said to include an expansion slot for a range of interface boards.

For the Apple II line of computers, the company introduced a 3½-in. floppy disk drive that can store up to 800K bytes of information. Available immediately, Unidisk 3.5 includes systems software utilities for formatting and duplicating diskettes and for copying and deleting files on a diskette.

It is designed to bridge the gap between Apple's low-end, 143K-byte floppy disk drives and its 10M-byte Profile hard disk. The Unidisk 3.5 costs $499.

Other products introduced by Apple include the following:

- The Apple Personal Modem, a Hayes Microcomputer Products, Inc.-compatible 300/1,200 bit/sec. modem. Currently available, the modem operates at 1,200 bit/sec., 110 bit/sec. or 300 bit/sec. for compatibility with other networks that require lower speeds.

The modem also uses the Hayes Smartmodem Command Set and can be connected to any personal computer with a standard RS-232C serial port. The Apple Personal Modem costs $399.

- Switcher, a utility that allows Macintosh 512K and Macintosh XL users to store up to eight applications in memory at the same time. Switcher also allows users to transfer data between Macintosh applications.

For example, users can copy a graphic from a Macdraw onto a Macwrite word processing document.

Early versions of Switcher were made available in April to Compuserve, Inc.'s Micro-Networked Apple User Group and to several software developers, including Microsoft Corp., which included the utility in its Excel spreadsheet product.

Individual copies of Switcher are priced at $19.95, the vendor said.

Two commercial Unix users stand by their systems

By Charles Babcock

NEW YORK — Two large users of AT&T Unix operating systems in commercial settings told attendees at the Unix Expo conference that they think they have made the right choice.

Both said, however, that they have had difficulty building a professional staff experienced in Unix.

Steven Stamps, director of development at J. J. Kenney Co., said his firm was trying to download 70% of the transaction processing currently handled by six Perkin-Elmer Corp. superminis onto 150 individual workstations.

J. J. Kenney is a broker of municipal securities for other brokerage houses. Many of the transactions that its computers must process are read-only or informational messages for its traders, and downloading them to AT&T Unix PCs would eliminate the need to expand its central data processing center, according to Stamps. The firm built a prototype system, and it is being used by six traders, but J. J. Kenney ran into difficulties.

"We found we did have a performance problem. The system became spongy at 10 terminal users. We had thought we could run 24," he said.

The development staff has had to reconfigure the system to get better response times, Stamps said.

George Grant, director of marketing for Quotron Systems, Inc., Los Angeles, said his firm spent five years preparing to market a Unix stock quotation and office automation system to brokerage houses.

One year to convert

According to Grant, Quotron's 80-member development staff spent from 1980 to 1983 building software development tools, including screen managers, window managers, a data base management system and forms manager.

Once the tools were assembled, the staff was able to convert Quotron's stock quote service into the C language in a year.

"It is the Unix system with the tool set that makes productive application development possible," Grant told conferencegoers, many of whom said they were interested in using Unix in their business offices.

Unlike Quotron, J. J. Kenney was able to buy many of the system utilities and the data base management system it needed rather than develop them itself. Availability of those products indicates how the market for Unix has changed in the last five years, Stamps said.

He and Grant both complained that it is difficult to find experienced Unix programmers and that such programmers were commanding top salaries. A programmer with five years' experience in Unix and 10 years' experience in data processing can earn $50,000, he said.

Stamps also said commercial users worry about the "polarization" between System V, which AT&T is promoting as a standard, and University of California at Berkeley's Version 4.2, which some users view as offering a wider selection of enhancements.

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Walker Interactive for sale?

Major software firms most probable bidders

By Maura McEnaney

SAN FRANCISCO — Walker Interactive Products, Inc. is for sale and could be sold within the next several weeks, according to industry sources and analysts.

But mum is the official word from the vendor of financial applications packages, once touted for its applications development tools and line of business financial software. Vendors rumored to be interested in the firm declined to comment.

Industry analysts said they heard of the Walker rumor as early as last April, and the software industry's leading vendors are quick to confirm the possibility of a sale. One vendor source said a sale to Management Science America, Inc. (MSA) was imminent, but another said any sale will take some time to finalize.

Potential buyers for the $20 million company include the industry's largest software vendors, among them MSA, McCormack & Dodge Corp., Cullinet Software, Inc. and IBM. Analysts have their own theories on the potential sale of the company, which has been troubled with poor sales and steep liabilities during the past several months.

William Shattuck, analyst with Montgomery Securities, put his bet on Cullinet as the most likely buyer of Walker. "It would make a lot of sense for Cullinet," Shattuck said, particularly in light of Cullinet's legal dispute with McCormack & Dodge over the international marketing rights for Cullinet's General Ledger package, originally purchased from McCormack & Dodge. One source, formerly associated with Walker, said MSA is the likely buyer, a view held by one of MSA's chief competitors.

Shattuck downplayed the MSA interest. "It seems to me [buying Walker] would make more sense for a company that is trying to get into the applications market rather than a company that has pretty much covered all the bases, like an MSA."

Brian Muttert, a software analyst with Robertson, Colman & Stephens, an investment banking firm here, would not comment on the pending sale of Walker, because of what he said was his firm's financial involvement with Walker Interactive.

Several years ago, Muttert said, Walker was viewed as a fast-track company that developed a solid reputation for its interactive software applications.

Launched as a consulting company by Jeffrey Walker in the mid-1970s, Walker garnered investments from venture capitalists and was reborn in 1980 as Walker Interactive Products. Shortly thereafter, the company recorded 200% annual sales growth on the strength of sales of its Integrated Interactive Financial Systems.

Computerworld *staff writer John Desmond also contributed to this report.*

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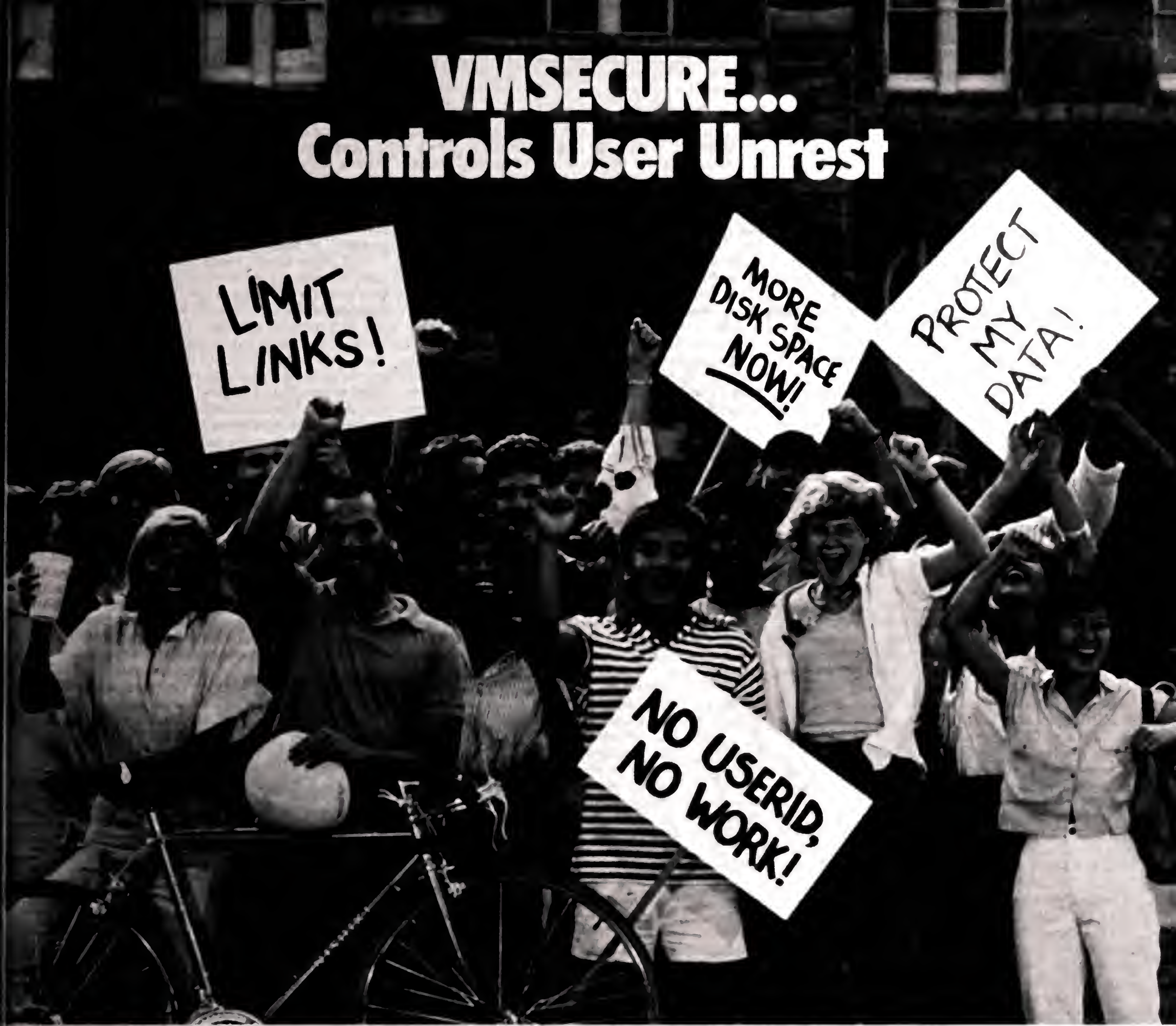
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From page 1

Productivity key concern at Software/Expo conference

and applications development without programmers. We are simply selling old technology repackaged."

DP and MIS managers interviewed at the Software/Expo last week expressed concerns about improving productivity, and many said they plan to do it with personal computer software ranging from decision support to graphics packages.

Jim Grayson, MIS manager with Standard Meat Co. of Fort Worth, Texas, said he was looking for a package offering good graphics on a personal computer to free up demand on the mainframe. "Graphics is a big CPU hog," he said.

Decision support software was being sought by Steve Chaney, information center manager for Standard Meat. The company's information center has worked well for middle management, "and now I want something easier to use for upper level executives," Chaney said. "At the executive level, they need more of a presentation system than something to develop applications with."

Controlling the proliferation of personal computers is a chief concern of Michael Friedkin, technical services manager in the Louisiana State Department of Labor, Baton Rouge. "Management has said to go out and buy personal computers. My unit has to coordinate all that and try to provide micro-mainframe links and support," he said. "One thing I want to look at is the information center concept to see if we can slow the need for links" and prolong the useful life of his mainframes, he said.

George Connor, systems analyst at the Sandia National Laboratories, Kirtland Air Force Base, Albuquerque, N.M., said he wants to quicken the pace of application development by having users do more on their own. "Our financial systems are all implemented, but the users want more," he said, pointing out his backlog. Recent research at the laboratory, which has a development and support staff of 108, showed that half of the staff's time is spent maintaining business applications.

Gene Ostlund, finance systems manager for Boeing Aerospace Co. of Seattle, said he hoped to find products that will help him distribute applications to end users and allow users to write ad hoc applications. "We are trying to do this with personal computers and fourth-generation languages," he said.

Not surprisingly, users made their way to Dallas' Infomart to learn more about fourth-generation languages, relational data base management systems and other products lumped under the banner of productivity tools. DBMS was born more than a decade ago, but it remains a basic concern of users who must integrate applications developed over a span of three decades. Software/Expo sessions seemed to offer just what these users were looking for: They focused primarily on day-to-day issues such as development, maintenance, DP management and the optimum use of productivity tools like DBMS and fourth-generation languages.

From page 1

Cincom announces relational DBMS for IBM mainframes

for IBM mainframes.

In the previous decade, Cincom took the early lead in the DBMS race with its Total product. But in recent years, the Cincinnati-based vendor has fallen behind such rivals as Cullinet Software, Inc. and Applied Data Research, Inc. (ADR) in the independent DBMS market. (IBM still maintains control over the DBMS market, but Cullinet and ADR have lately boasted impressive gains over Big Blue.) Cincom is hoping to turn that around with the debut of its Superior Relational Architecture (Supra) "advanced" relational DBMS.

According to Cincom President Dennis Yablonsky, the advanced aspect of the product is that it implements the American National Standards Institute's ideal DBMS model. Although the model drafted by the institute's Standards Planning and Requirements Committee — which was made up of representatives of major hardware and software vendors and some of the largest U.S. companies — is more than a decade old, Yablonsky said Cincom has become the first vendor to implement it fully in a commercially available relational system. Yablonsky hosted the company's multimedia press unveiling of Supra during the Software/Expo conference held in the Infomart facility.

Yablonsky said Supra meets the committee's requirement that a relational DBMS incorporates a three-schema architecture. That means the system maintains three independent definitions (schemas) of data: an external or user view; a conceptual view that organizes data in a relational table format; and an internal or physical view of how data is managed and stored. He said most relational DBMS, including Cullinet's IDMS/R, ADR's Datacom/DB and Cincom's existing TIS product, currently only support a two-schema architecture.

In addition to leading Cincom's renewed attack on the DBMS market, Supra has also become the flagship of the company's newly focused product line. Under the banner of TIS/XA, Supra joins Ultra, the company's Digital Equipment Corp. VAX-based DBMS; its Mantis applications development system; its Control series of manufacturing and financial applications; and its Net/Master and PC/Contact network management systems.

"TIS/XA is intended to automate the automation process," Yablonsky said. "Supra shows that we are in the DBMS market to stay. We intend to take back our rightful place through aggressive development and marketing."

The three-schema design, Yablonsky said, automates a variety of functions, relieving programmers and data base adminstrators from writing teleprocessing monitor and data base navigation and derivation logic and data integrity code. By separating the conceptual data view from the physical view, he said, Supra eliminates data redundancy, allows for the enforcement of data integrity constraints and enables users to restructure the physical data base without modifying existing applications.

Supra consists of five components. The Spectra information retrieval and application development system, which customers got a sneak peek at during Cincom's recent Directions '85 conference, enables end users to access data through nonprocedural commands. The Normal data base administration tool automates logical and physical data base design through a set of tools that assist the data base administator.

According to Yablonsky, the Relational Data Manager component supports the three components of the relational data model: relational structure, manipulation and integrity. Manipulations include the SELECT, PROJECT and JOIN commands that must be supported in a true relational DBMS. Supra's Physical Data Manager supports all data structuring techniques such as indexing, chaining, sequential and flat file. Yablonsky said the component was designed to reduce physical I/Os and ensure high performance. He said the data manager also supports on-line dynamic file allocations or deallocations for nonstop processing. Supra integrates data in the data manager and native IBM Vsam files, providing users access to data in existing Vsam-based applications.

Infomart, site of this year's Software/Expo

CW PHOTO BY JOHN GALLANT

The final component, the In-Line Directory, controls data access, security and applications development. It maintains information about users, programs, views and data definitions and integrates all Supra components.

Supra, available now, costs $145,000 for IBM DOS/VSE and $215,000 for MVS or MVS/XA.

Limited product debuts seen at Software/Expo

DALLAS — With the introduction of its Superior Relational Architecture relational data base management system, Cincom Systems, Inc. of Cincinnati led the rather slim pack of software vendors unveiling products at last week's Software/Expo conference.

While not introducing a software offering, Vienna, Va.-based Boeing Computer Services Co. announced site licensing options for all of its microcomputer software products and for some of its mainframe tools. At an Infomart press briefing, the company said it will offer unlimited right-to-copy licenses for one company site or for a group of sites to provide more purchasing flexibility for its customers.

Citing the recent controversy over software copying, Boeing said it wanted to take a firm stand and address larger organizations' need to overcome copy protection limitations. As an example of how the pricing schemes would reduce costs, a spokesman said a buyer could save more than 90% on the single-copy price of the Boeing Calc package, depending on the pricing plan chosen. Boeing will provide reproducible diskettes and camera-ready copies of documentation.

Forecasting Planning Associates and Systemware, Inc., both of Dallas, jointly announced Data Center Manager/1. The product, designed to run on an IBM Personal Computer, aids DP professionals in the management of computer equipment, software and supplies. Data Center Manager/1 offers an inventory data base that supports disaster recovery planning, budgeting and forecasting, configuration management and component failure impact analysis.

The package consists of separately priced basic inventory, budgeting, configuration and maintenance modules. Basic inventory is available now for a one-year license fee of $4,995. Other modules are scheduled to be available later in the year at prices to be announced.

Austin, Texas-based Data Interface Systems Corp. unwrapped its DI-3270/L product for IBM 3270 Personal Computer-terminal emulation. A spokesman said the products use local-area network technology to support micro-to-micro communications and that one or more micros in the network serve as gateways to a host system, acting as an IBM 3274 controller. All micros in the network act as 3278 terminals and 3287 printer controllers, with up to four logical units supported at each node.

A stand-alone implementation of the system is also available. Currently available for bisynchronous systems, DI-3270/L will reportedly support IBM's Systems Network Architecture in 1986. Pricing ranges from $650 to $950 per node. Stand-alone version pricing starts at $300.

Arlington, Texas-based Southwest Software Services, Inc. introduced Version 3 of its Zeke — The Controller automated scheduling and dispatching system for batch jobs under IBM's DOS/VSE and MVS operating systems. Enhancements enable automatic replies to job messages to be defined to the system along with the reply Zeke is to use. Dates and critical run parameters can be cataloged, checked, verified and automatically entered by Zeke when a specified program requests the information.

In addition, an on-line security system has been added, and multisystems support enables the Zeke data base to be shared between DOS/VSE, MVS and CMS. The DOS/VSE version of Zeke costs $11,500, and the MVS version costs $19,500.

Al Lee & Associates, Inc. of Dallas announced enhancements to its Magec on-line applications development system for IBM OS and DOS users. A utility function has been added to generate data item definitions automatically from existing Cobol copy book definitions. The system's access method transparency feature has been expanded to support IBM's Vsam, Isam and Bdam and Applied Data Research, Inc.'s Datacom/DB.

Magec costs between $28,000 and $72,000, depending on configuration and operating system.

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All seminars through December 31 are listed below. Call for information on later seminars.

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State, City	Date	Database Management System IDMS/R	Information Center Management System	Applications		
				Manufacturing	Financial	Human Resources
ALABAMA						
Birmingham	11-13-85	●	●	●	●	●
Montgomery	12-4-85	●	●			
ARIZONA						
Phoenix	9-25-85	●				
CALIFORNIA						
Los Angeles	9-24-85	●	●	●	●	●
Los Angeles	11-6-85	●				
Orange County	10-3-85	●	●	●	●	●
Sacramento	9-23-85	●				
San Diego	10-23-85	●	●	●	●	●
San Francisco	9-26-85	●	●	●	●	●
San Jose	11-6-85	●	●	●	●	●
COLORADO						
Denver	11-12-85	●	●	●	●	●
CONNECTICUT						
Hartford	11-19-85	●	●	●	●	●
DELAWARE						
Wilmington	9-25-85	●				
DISTRICT OF COLUMBIA						
Washington D.C.	11-26-85	●	●	●	●	●
FLORIDA						
Jacksonville	11-20-85	●				
Orlando	10-3-85	●	●	●	●	●
Tallahassee	12-6-85	●				
Tampa	11-6-85	●	●	●	●	●
GEORGIA						
Atlanta	12-11-85	●	●	●	●	●
HAWAII						
Honolulu	11-26-85	●				
ILLINOIS						
Chicago	9-25-85	●	●	●	●	●
Chicago	12-4-85	●	●	●	●	●
INDIANA						
Fort Wayne	9-27-85	●	●	●	●	●
Indianapolis	12-11-85	●	●	●	●	●
South Bend	12-3-85	●	●	●	●	●
IOWA						
Des Moines	10-2-85	●	●	●	●	●
MAINE						
Portland	10-16-85	●				
MARYLAND						
Baltimore	10-15-85	●	●	●	●	●
MASSACHUSETTS						
Boston	12-12-85	●	●	●	●	
Burlington	9-24-85	●				
MICHIGAN						
Detroit	11-14-85	●	●	●	●	●
Grand Rapids	10-18-85	●	●			
MINNESOTA						
Minneapolis	9-26-85	●	●	●	●	●
Minneapolis	12-12-85	●	●	●		
MISSISSIPPI						
Jackson	11-5-85	●	●	●		
MISSOURI						
Kansas City	9-24-85	●	●	●	●	●
Kansas City	12-13-85	●	●			
NEBRASKA						
Omaha	12-9-85	●	●	●	●	●
NEW JERSEY						
Fairfield	9-24-85	●	●	●	●	●
Princeton	11-15-85	●	●	●	●	●
NEW MEXICO						
Albuquerque	10-15-85	●				
NEW YORK						
Albany	11-7-85	●				
Long Island	9-24-85	●				
New York	11-7-85	●	●	●	●	●
New York	9-11-85	●				
Rochester	10-24-85	●	●	●	●	●
Syracuse	12-12-85	●				
NORTH CAROLINA						
Charlotte	12-10-85	●	●	●	●	●
Greensboro	10-3-85	●	●	●	●	●
OHIO						
Cleveland	9-12-85	●	●	●	●	●
Columbus	9-25-85	●	●	●	●	●
Columbus	12-12-85	●	●	●	●	●
OKLAHOMA						
Oklahoma City	12-3-85	●	●	●	●	●
OREGON						
Portland	10-1-85	●	●	●	●	●
PENNSYLVANIA						
Philadelphia	11-21-85	●	●	●	●	●
Pittsburgh	10-15-85	●	●	●	●	●
RHODE ISLAND						
Providence	11-6-85	●				
SOUTH CAROLINA						
Charleston	11-20-85	●	●	●		
Columbia	11-7-85	●	●	●	●	●
Greenville	10-1-85	●	●	●	●	●
TENNESSEE						
Chattanooga	12-18-85	●	●			
Knoxville	11-20-85	●	●	●		
Memphis	9-25-85	●	●	●	●	●
Memphis	12-3-85	●				
Nashville	10-30-85	●	●	●	●	●
TEXAS						
Abilene	10-1-85	●				
Amarillo	12-4-85	●				
Austin	12-12-85	●	●	●	●	●
Corpus Christi	11-5-85	●				
El Paso	11-6-85	●	●	●	●	●
Houston	9-24-85	●	●	●	●	●
Lubbock	10-17-85	●				
San Antonio	10-29-85	●	●	●	●	●
Tyler	10-16-85	●				
UTAH						
Salt Lake City	9-21-85	●	●			
VIRGINIA						
Lynchburg	12-17-85	●				
Norfolk	11-12-85	●				
Richmond	10-29-85	●				
WASHINGTON						
Seattle	12-12-85	●	●	●	●	●
Spokane	11-14-85	●				
WISCONSIN						
Milwaukee	10-16-85	●	●	●	●	●

CULLINET SEMINARS/CANADA FALL/WINTER 1985

Province, City						
ALBERTA						
Calgary	10-17-85	●			●	
Edmonton	10-15-85	●			●	
MANITOBA						
Winnipeg	11-28-85	●	●	●	●	
NOVA SCOTIA						
Halifax	10-22-85	●			●	
ONTARIO						
Ottawa*	9-26-85	●				
Ottawa*	12-12-85	●				
Toronto	9-24-85	●	●	●	●	
Toronto	11-19-85	●	●	●	●	
QUEBEC						
Montreal	12-10-85	●				
Montreal	12-18-85	●	●	●	●	
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Cobol 85 standard wins Ansi approval

By John Gallant

Cobol 85 is a U.S. standard at last. The American National Standards Institute (Ansi) gave its final approval to the proposed language upgrade less than one month after receiving the Cobol 85 standard document from its drafters.

In a sooner-than-expected move that surprised even insiders [CW, Sept. 16], Ansi's Board of Standards Review approved the Cobol 85 standard through letter balloting that ended Sept. 10. According to Dorothy Hogan, vice-president of communications for Ansi, 11 members of the 12-member review board voted to approve the standard; one ballot was not returned.

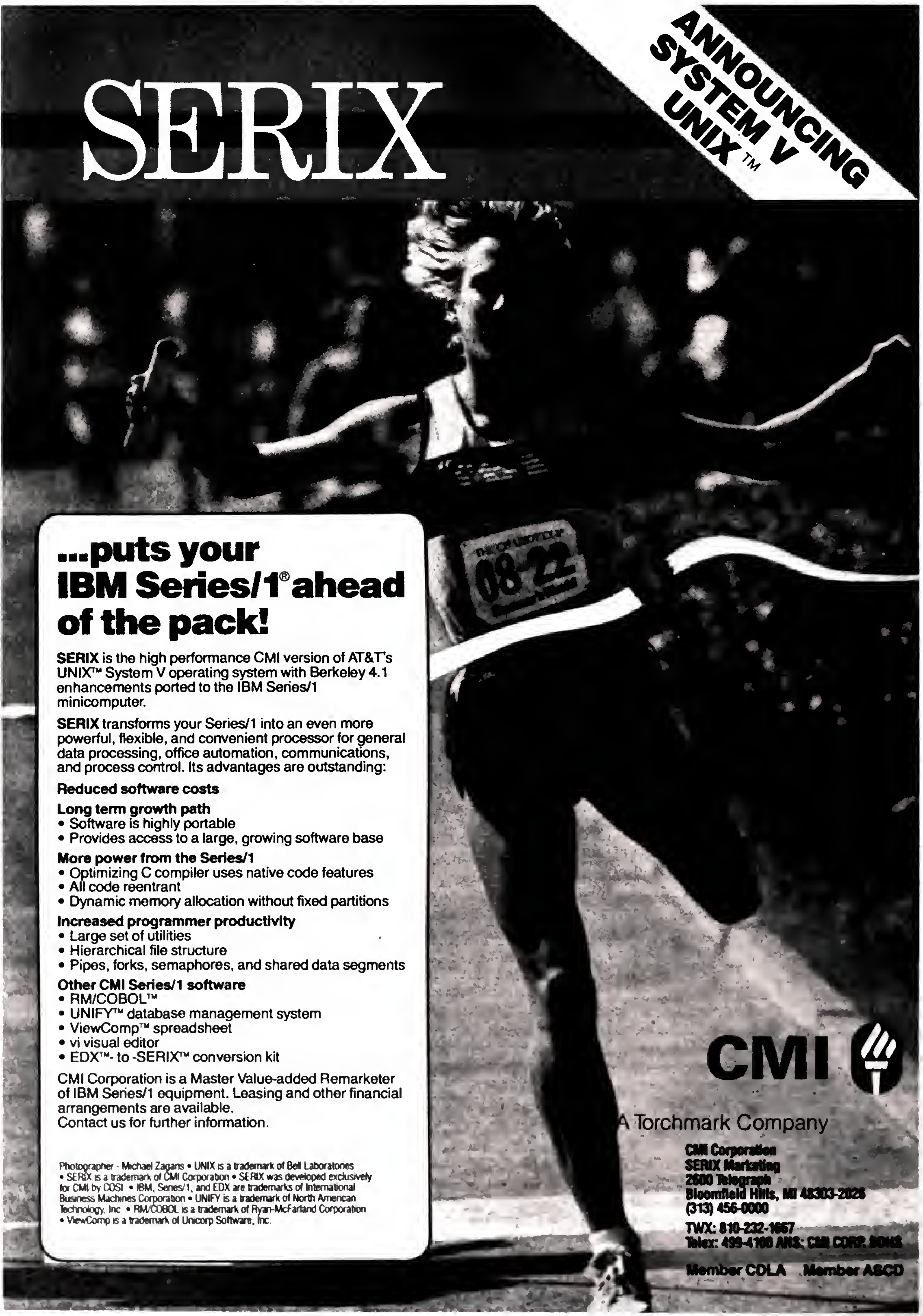
The Board of Standards Review received the Cobol 85 draft standard from Ansi's X3 committee — primary drafters of the upgraded language — in late August. X3 committee members told *Computerworld* at that time they were not expecting a final vote on the document until later in the year.

Committee members received no special notification of final approval and only learned of the vote through a periodically distributed Ansi publication.

"It's great news that we now have an American standard," said Jerome Garfunkel, a member of the Ansi X3J4 Cobol subcommittee and founder of Jerome Garfunkel Associates, Inc. "But the news comes as something of a surprise. It points out one of my greatest disappointments with the whole standards procedure. Even as a member of the Cobol committee, it has been very difficult to find out what stage the document was at and when it was to be approved."

According to Ansi's Hogan, the Board of Standards Review's vote set in motion a 30-day period during which people can appeal the approval. But, she said, no objections have yet been received.

The Cobol 85 standard now awaits only final International Standards Organization approval, a step expected before year's end.



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TOP OF THE NEWS

Continued from page 1

at Moffett Field, Calif. **For more on the Cray X-MP, see page 4.**

■

Ranks of IBM Personal Computer AT clones can soon swell with an entry from Hewlett-Packard, a machine currently code-named Viceroy. The system, which could debut in the next few days, is said to be priced lower than the AT and to offer a floppy-disk controller and up to 640K bytes of memory. HP will also toss in its line of specialized graphics cards and monitors, making Viceroy suitable for computer-aided design and manufacturing tasks.

■

The saga of the IBM PCjr continues. Last week the company told its employees that they could purchase the erstwhile Peanut, complete with color monitor, disk drive and three software programs for a bargain-basement price of $450. The original price tag for the PCjr was in the $1,200 neighborhood. To reduce inventories further, currently estimated to be well in excess of 100,000 units, IBM is expected to flood retail outlets with PCjrs just in time for Christmas shopping and with a base price of about $600. Last Christmas they cost approximately $750.

■

A couple of weeks after Apple Computer Marketing Vice-President William Campbell pronounced the demise of the Macintosh Office concept ("We don't have the products to sell the Mac Office") at the Macworld Expo in Boston, Apple pops up on the CBS network presentation of *Death of a Salesman* advertising . . . Mac Office. Actually, there is a nice counterpoint between the two seemingly clashing episodes: Picture beleaguered salesman Campbell as a high-tech Willy Loman and Mac Office as a system that is liked but not *well liked.* **For more on Mac and Apple, see page 1.**

■

Ulric Weil, principal at Morgan Stanley & Co. and experienced IBM watcher, said that IBM booked $6 billion in orders for its 3090 mainframe line in the second quarter of 1985. These orders were so significant in and of themselves, Weil said, that the computer industry as a whole was able to post a 13% increase over 1984's second quarter.

■

It was a busy week for bicoastal data base ballyhoo. On the East Coast, the principals in a new company called Ansa Software — President Steve Dow and venture capital angel Ben Rosen — visited prospective corporate clients, dealers and trade press reporters to beat the drums for their Lotus Development Corp. 1-2-3-compatible micro data base management system Paradox. And out west, Symantec Corp. — headed by former Lotus and Microsoft Corp. executive Vern Raburn — finally released its integrated Q&A package, which includes a data base function and a natural-language front end. **More on both products, page 12.**

IBM software targets 4700 system, mainframe Unix

By John Gallant

IBM last week unleashed software that brought its 4700 financial system into the Office Systems architecture and provided an array of applications and development tools for its mainframe Unix operating system.

IBM's introductions brought yet another processor — the 4700 Personal Computer — into its strategic DIA and Distributed Office Support System (Disoss) linked family of products. In addition, the products for the IX/370, IBM's VM-hosted implementation of AT&T's Unix System V, seemed to signal an intention on IBM's part to make IX/370 a more viable operating system alternative.

An IBM spokesman said the announcement of 4700 Personal Computer Office Systems support provides "an initial offering of access to DIA distribution services for users in a 4700 system environment." He said that through compatibility of IBM Personal Computer products, including Personal Services/PC, on the 4700 Personal Computer, "a broad base is established for continuing IBM 4700 Office Systems support" — a statement that paves the way for other 4700 financial system products to be brought into the Office Systems fold in the future.

With Personal Services/PC running on a 4700 Personal Computer or a Personal Computer attached to a 4700 Controller, users gain access to DIA distribution services to and from Disoss on a host processor. Distribution services refers to the sending and receiving of messages, documents and Personal Computer files.

Text documents created on the 4700 Personal Computer running Displaywrite 2 or 3 and Personal Services/PC can also use Disoss for distribution. Office Systems support will be available when the previously introduced RM4700CTLR package for the 4700 controller and 4700 Personal Computer Application Services package become available later this month. Pricing is based on individual product prices.

IBM's nine IX/370-related announcements included the following:

■ IX Cobol ($6,000), a version of Austec, Inc.'s ACE Cobol modified to operate under IX/370. It supports record and file locking and is based on American National Standards Institute's (Ansi) Cobol 74 standard.

■ IX Basic ($3,500), an Ansi Minimal Basic standard compiler and interpreter.

■ IX Pascal compiler ($4,800), a Unix implementation of Pascal that allows users to compile and execute Pascal programs under IX/370.

■ IX Prochart ($16,000), a version of Visual Engineering, Inc.'s Visual:Prochart. It allows users to create business graphics and is based on the Ansi Graphics Kernel Standard.

■ IX Integrated Word/Math ($12,000), integrated office automation software that was previously announced for the IBM Personal Computer.

■ IX Ultracalc ($10,000), developed by Olympus Software, Inc. It is a financial planning and modeling package with business graphics.

■ IX Informix ($14,000), an implementation of Relational Database Systems, Inc.'s Informix relational data base management system.

In conjunction with IX Informix, IBM also introduced the IX Informix Embedded Query Facility for Cobol ($9,000), which allows users to build custom data base applications under IX Cobol; and IX Informix Embedded Query Facility for C ($9,000), which supports the use of query language statements to access data bases from C programs and allows users to call C functions and use C library routines while using the IX Informix product.

> ”
>
> *With Personal Services/PC running on a 4700 Personal Computer or a Personal Computer attached to a 4700 Controller, users gain access to DIA distribution services to and from Disoss on a host processor.*

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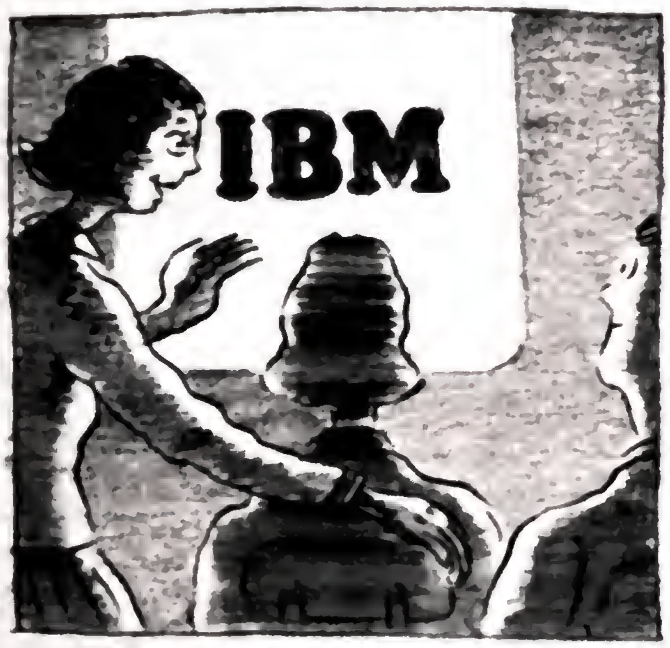

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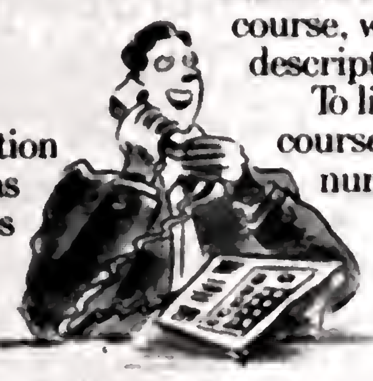

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Ansa offers Paradox IBM-compatible relational DBMS

By Donna Raimondi

A microcomputer data base management package from Ansa Software with the ability to import Lotus Development Corp.'s 1-2-3 data directly into its data table was scheduled for release and shipment today.

The Paradox relational data base management package for IBM and compatible microcomputers is the first product from Ansa, a company backed by venture capital firms Kleiner, Perkins, Caulfield & Byers and Sevin Rosen Management. The latter is a principal backer of Lotus and Compaq Computer Corp.

Paradox uses machine reasoning features to evaluate user requests and to write programs that seek the fastest route to an answer, according to Stephen M. Dow, president of the company and a partner on leave of absence from Sevin Rosen. In an interview last week, Dow said the package will be shipped through dealer channels immediately and will sell for $695. The company does not plan any direct sales, he said.

Lotus 1-2-3 similarity called a benefit

Paradox's similarity to 1-2-3 is a major benefit to users, according to beta test site user Lesley Pollitt, director of software management at Micromentor, Inc. in Cambridge, Mass. It allows 1-2-3 users to learn Paradox easily, she said.

Paradox is said to handle information management problems through query by example, program synthesis and heuristic query optimization techniques.

Data from a variety of sources can be integrated into Paradox, the vendor said.

The software's built-in programming language, PAL, is said to enable users and programmers to develop turnkey applications that meet their specific needs.

Paradox uses tables to display information in rows and columns. The columns hold categories of information while the rows show individual records. Each table or file can contain up to 260 million characters — formatted in 65,000 rows and 255 columns, with 4,000 char./row and 255 char./col.

A form is used to display data when working with information about one record. Any change made in the form is reflected immediately in the table. Forms can have borders, boxes and annotations on the screen.

Query forms on the screen enable users to retrieve, select or perform calculations on information in the tables. Users question their data by checking off columns and selecting rows.

Reports can be user designed or employ the Paradox program's standard reports.

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Symantec package out

By Jeffry Beeler

PALO ALTO, Calif. — A closely watched four-year-old software company last week released its first product, an integrated data base, word processing and report generator package that will use a natural-language interface, according to its developer, Symantec Corp.

The Cupertino, Calif.-based vendor's Q&A product will reportedly unite its data base, word processing and report generator functions to allow users of IBM or IBM-compatible micros to produce documents that derive their contents from two or more sources.

To perform tasks such as writing memos or updating data bases, a user summons a high-level menu that lists Q&A's constituent modules — the File data base, Report format generator and Write word processor. The user then simply selects the menu heading for the desired module.

Q&A uses its natural language interface to create and update data bases without moving to other programs or swapping disks, the company said.

Q&A's natural language capability resides in the product's "intelligent assistant," which enables users to create, populate, edit and update data bases with English language commands rather than with a formal query language.

According to beta user Jay Yamada, who serves on the board of directors for KQED, San Francisco's public television station, the station has used Q&A for about two months.

"I would typically spend two to three days creating [Ashton-Tate, Inc.] Dbase III screens and prompts for KQED's data base," Yamada said during a private interview. With Q&A he was able to perform the same tasks in about 10 minutes.

Q&A's systems prerequisites include 512K bytes of random-access memory and a choice of either two floppy disk units or one floppy and a hard disk module..

For users who already have 512K-byte IBM-compatible micros, the Symantec package sells for $299. When Q&A is bundled with a 256K-byte expansion board, the purchase price rises to $349.

Lotus to deliver remedy for Symphony 1.1 defect

CAMBRIDGE, Mass. — The latest version of Symphony needs some fine-tuning to correct a bug that may cause data to be lost, Lotus Development Corp. revealed last week.

The company said it will send existing users two replacement disks next month to correct the problem.

The bug in Release 1.1 can cause data losses when the user is inserting or deleting rows and columns and moving ranges. The bug was discovered by "quality assurance people and a couple of customers," a spokesman said. Release 1.1 began shipping July 22.

Lotus President Jim Manzi said the company was receiving about 10 complaints a day from Symphony users. Appearing at a press conference to kick off formally the company's Signal product [CW, Sept. 16], Manzi declined to say how many copies of the program had been shipped with the bug in it, although all those copies sold since the version was released contained it, he said.

According to Manzi, not every user of Symphony would have experienced the defect, although it may occur during use of common spreadsheet functions, including inserting and deleting data or transferring numbers between sections.

Stephen J. Crummey, vice-president of sales and service, downplayed the problem, calling it "not a big deal." The fix for the Symphony version that came out on July 22 is not totally resolved, he said. The company will probably swap two of the six diskettes in the Symphony package. The solution will be out in early October at no cost to registered users, Crummey added. An updated version of Release 1.1 will be shipped to dealers within the next week.

In the meantime, users can minimize the risk of losing data if they save their worksheets before using the INSERT, DELETE or MOVE commands, a spokesman said.

One user told *Computerworld* that Symphony has an additional problem with its color features. Release 1.1 is supposed to show both text and graphs in color, according to Russell Baris, project analyst at Pfizer, Inc. of New York who has had the version for about three weeks. When used with an IBM Personal Computer AT or a Compaq Computer Corp. Deskpro 286, the color does not come through on text, he said, adding that Release 1 did color the text. Baris said he told Lotus about the problem and was informed a fix would be sent when available.

A spokesman admitted that Release 1.1, when used with IBM's color card and a color monitor, can produce black and white text for some users. That glitch, along with other bugs that have been reported by users since the package was released, will be corrected in the forthcoming fix.

TCA crowd in buying mood

By Paul Korzeniowski

SAN DIEGO — There was little evidence of a slump at the Telecommunications Association 1985 conference last week where crowded aisles made it difficult to walk around, and users said they were in a buying mood.

The show attracted 250 vendors, up from 220 in 1984, and the association predicted attendance would total 14,000 people, up from 12,700 last year.

The audience seemed to be equally divided into users and vendors, with large contingents from MCI Communications Corp., AT&T and Pacific Bell.

Users interviewed by *Computerworld* were in a buying rather than a browsing mood. Most were evaluating products that had been previously introduced. Only one product announced at the show was mentioned by a user as a probable purchase. J. P. D'Amico of the Los Angeles Police Department expressed an interest in T-Bar, Inc.'s 2001 matrix switch. He was not interested in a similar offering IBM unveiled a week before the show. "We are staunch supporters of [Digital Equipment Corp.] equipment," D'Amico stated.

Richard P. Schoettger Jr., a programmer analyst at Guild Mortgage Co. in San Diego, was evaluating all the items necessary to link his company's IBM System/38 to remote offices. His shopping list included modems, multiplexers and common-carrier services. "I was surprised that satellite equipment had progressed so much," he noted. "The satellite companies seem to have solved the problems of voice delay."

Nick Cook, vice-president of telecommunications at First Nationwide Corp. in San Francisco, was checking to make sure that he didn't overlook any item necessary when his company installs its first T1 line next month. "My best advice has come from other users whom I met during lunch," he said.

Other managers were interested in products that would enable them to squeeze more performance out of existing equipment. John G. Gacek Jr., director of telecommunications operations at the Chicago Board Options Exchange bought a private branch exchange in 1983. At the show, he was searching for a call management software package that would enable him to determine how that private branch exchange is used. Call management packages store data from local and long-distance calls and produce a number of reports that help managers determine if telephone lines are needed or telephone services could be eliminated.

Network management packages supply the same type of capabilities to companies with data networks, and Keith Felton, communications systems manager at California Casualty Management Co. in San Mateo, Calif., was inspecting these offerings. "The network diagnostic products included more features than I would have expected," he said.

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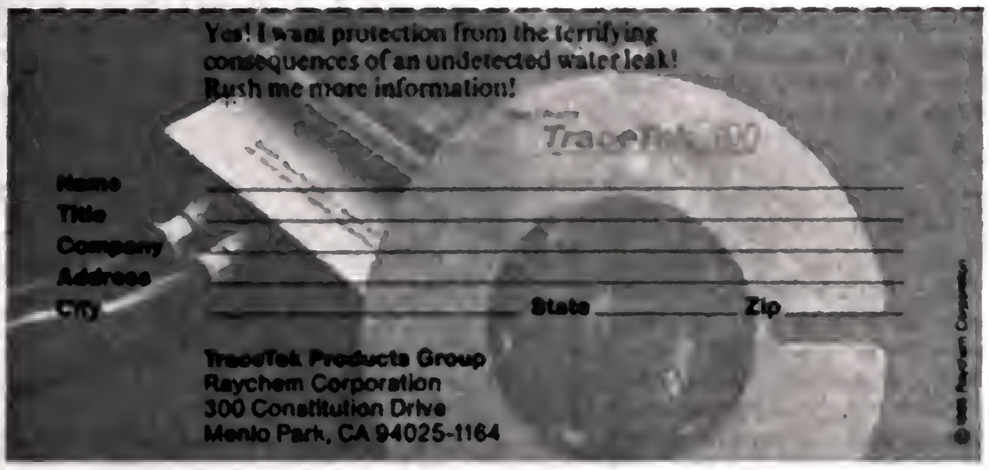

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IBM expands net strategy with protocol converters

By John Dix

RYE BROOK, N.Y. — Driven by the need to mesh support of Personal Computers and minicomputer equipment into its mainstream networking strategy, IBM last week announced two protocol conversion devices.

The announcement involved the 3708 network conversion unit and an eight-port communications adapter for a previously announced network controller. Both devices convert asynchronous Ascii data streams into IBM's Synchronous Data Link Control (SDLC), the protocol of its Systems Network Architecture (SNA), and provide full screen 3270 data format emulation.

These announcements come one year after the unveiling of IBM's first two major products in this area, the 7171 Ascii Device Attachment Control Unit and the 3710 Network Controller.

Analysts said IBM has little choice but to broaden its support of asynchronous Ascii communications because that is the natural protocol of its widely used Personal Computer. It also opens the door to the synchronous Ebcdic realm of IBM for users of typical minicomputer peripherals such as asynchronous Ascii terminals, printers and plotters.

Ten-port device

The new 3708 network conversion unit is a 10-port device that can be configured with one or two host links, leaving, respectively, nine or eight ports to support asynchronous Ascii devices. Besides performing the Ascii-to-SDLC conversion, the $4,500 unit provides full screen 3270 emulation.

Ascii devices, which can be located up to 4,000 ft from the 3708, are supported at speeds up to 19.2K bit/sec. through RS-232C interfaces. Remote devices can be supported with modems. When the 3708 is configured with two host links, one running to an IBM processor and the other to an Ascii host, terminal users can select the desired host through a menu. The 3708 is scheduled to be available next month.

The concurrently announced eight-port communications adapter provides the same protocol conversion functions as the 3708 but as an internal card option for the previously announced 3710 Network Controller. The 3710 concentrates three types of protocols — SDLC, IBM's Binary Synchronous Communications protocol and selected asynchronous protocols — over one SDLC or X.25 communications link.

While the 3710 previously supported asynchronous data streams, it did not provide protocol conversion. The 3710 can be outfitted with seven of the new $3,300 communications adapters — slated for delivery in the first quarter of 1986 — to provide up to 56 Ascii ports. From the host side, the Ascii devices look like 3270 devices attached to a Physical Unit Type 2 3274 cluster controller.

"IBM has to support Ascii because of the [Personal Computer] and the need to coexist in multivendor shops," according to Dave Moschella, director of computer market planning services at International Data Corp., a market research firm in Framingham, Mass.

Besides Personal Computers, the mainframe maker has turned to asynchronous Ascii communications with its System/36, said Peter Lowber, director of information systems with the Yankee Group, a Boston-based consultancy. "It might make sense to use Ascii locally in these environments," Lowber noted, "and 3270 to access the corporate data base."

IBM's intentions are not so benevolent in the view of Dale Kutnick, an independent consultant in Wayland, Mass.

"IBM wants to push SNA as a standard further down into corporations. That means it is going to have to support asynchronous Ascii, non-IBM devices to a much greater extent," he said.

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Justice pushes stronger computer crime law package

By Mitch Betts

WASHINGTON, D.C. — The U.S. Department of Justice last week offered anew its computer crime legislation, as part of a package of eight bills attacking white-collar crime and contract fraud.

The computer crime legislation is virtually the same as the administration bill offered last year (S. 2940). U.S. Attorney General Edwin Meese III said the Federal Computer Systems Protection Act of 1985 would repeal and replace the "incomplete and flawed" computer crime legislation enacted by Congress last year.

The Justice Department's bill would make it a federal felony to engage in computer fraud or theft or to damage computer hardware or data when the offense involves computers used by the U.S. government, federally insured financial institutions or private businesses engaged in interstate or foreign commerce.

The Justice Department repeatedly has attacked the Computer Fraud and Abuse Act of 1984 enacted by Congress — and drafted mostly by the House Subcommittee on Crime — for technical and drafting flaws. The statute outlaws unauthorized access to data stored in federal government computers [CW, Oct. 11, 1984].

Sen. Strom Thurmond (R-S.C.) and Rep. Hamilton Fish Jr. (R-N.Y.) are expected to introduce the package for consideration by Congress' judiciary committees.

Meanwhile, Sen. Patrick J. Leahy (D-Vt.) is on the verge of introducing the Electronic Communications Privacy Act [CW, Aug. 12], according to an aide.

In a recent speech to the Electronic Mail Association, Leahy said the bill provides civil and criminal penalties for unauthorized access to the computers of a communications system — if data is obtained or altered — and provides civil remedies for the unauthorized disclosure of the contents of an electronic message.

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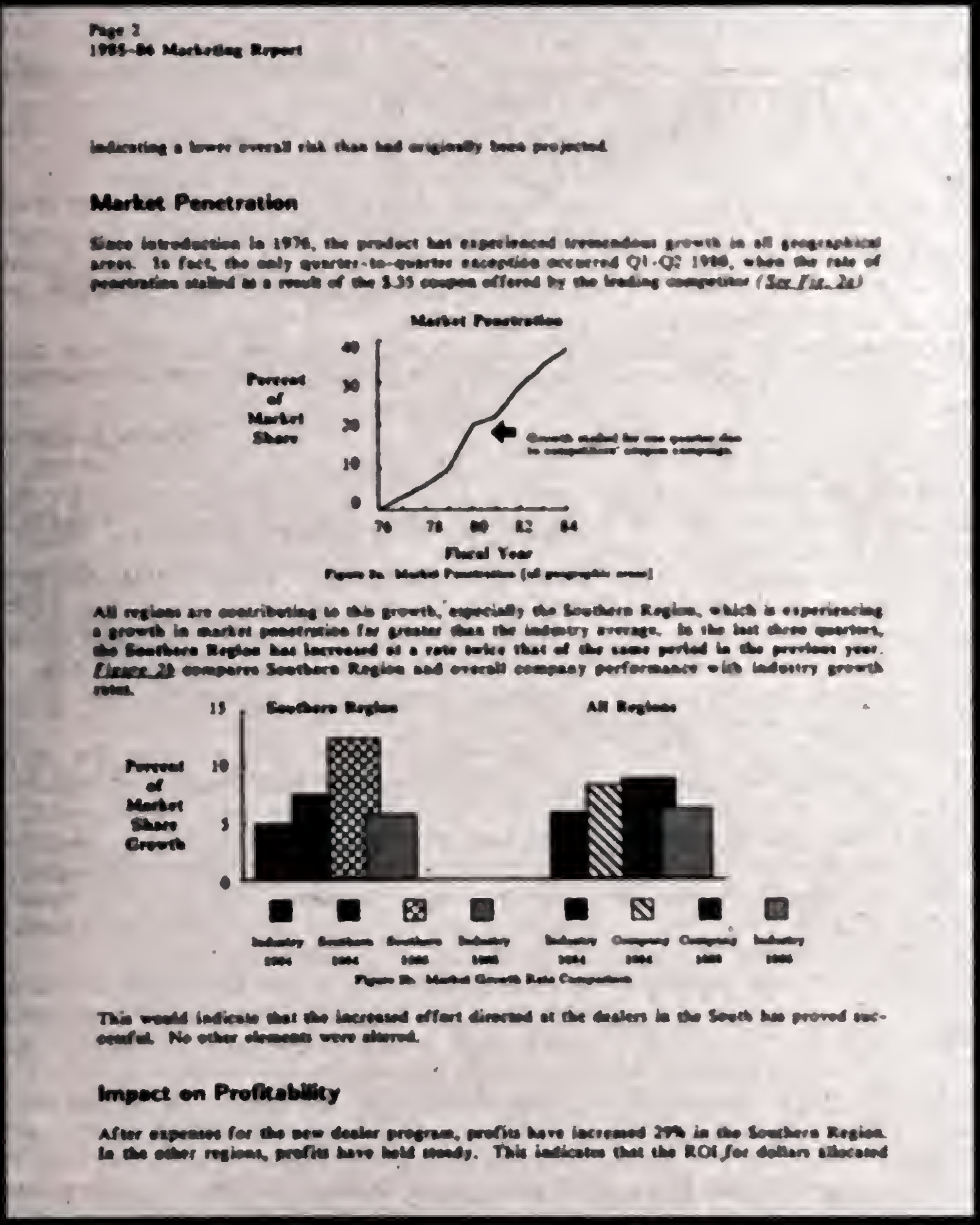
Market Penetration
Percent of Market Share
40
30
20
10
0
70
78
80
82
84
Fiscal Year
Growth stalled for one quarter due to competitors' coupon campaign.
Southern Region
All Regions
Percent of Market Share Growth
15
10
5
0
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indicating a lower overall risk than had originally been projected.

Market Penetration

Since introduction in 1976, the product has experienced tremendous growth in all geographical areas. In fact, the only quarter-to-quarter exception occurred Q1-Q2 1980, when the rate of penetration stalled as a result of the $.35 coupon offered by the leading competitor (See Fig. 2a)

Figure 2a. Market Penetration (all geographic areas)

All regions are contributing to this growth, especially the Southern Region, which is experiencing a growth in market penetration far greater than the industry average. In the last three quarters, the Southern Region has increased at a rate twice that of the same period in the previous year. Figure 2b compares Southern Region and overall company performance with industry growth rates.

Figure 2b. Market Growth Rate Comparison

This would indicate that the increased effort directed at the dealers in the South has proved successful. No other elements were altered.

Impact on Profitability

After expenses for the new dealer program, profits have increased 29% in the Southern Region. In the other regions, profits have held steady. This indicates that the ROI for dollars allocated

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HEWLETT PACKARD

IBM blasts apartheid

By Donna Raimondi

ARMONK, N.Y. — Escalating civil unrest and the economic uncertainties of doing business in South Africa prompted IBM last week to issue a strong statement demanding that the South African government address the problems of apartheid.

The statement harshly criticized the unbending policies of apartheid that, the company said, are undermining the business climate there. "We have stated that we believe economic activity can facilitate positive social change," IBM said. "We are following this principle when we say we intend to remain in South Africa as long as we can maintain an economically sound business and as long as there is a chance that we — together with others — can contribute to peaceful change."

But IBM said it is "very discouraged by the current political situation and the resulting business environment in South Africa, which are reducing the chances of meeting those objectives."

IBM also said the government there has not shown progress in dealing with its problems. "The rapidly deteriorating situation is having a significant impact on IBM's South African business as well as business in general in South Africa," IBM said. "It is imperative that the South African government address the problems of apartheid with the compelling and urgent attention they deserve."

The statement goes beyond previous IBM pronouncements on apartheid and, according to IBM spokesman Michael Dutton, was prompted by business instability caused by customers taking their business to foreign competitors in fear of U.S. policy restrictions.

VIEWPOINT

EDITORIAL

The computer did it

A month ago we reported that a faulty computer modeling program was possibly to blame for Union Carbide Corp.'s failure to warn adequately neighbors of its Institute, W. Va., plant that a cloud of toxic gas had escaped. [CW, Aug.19].

According to these initial reports, a computer modeling program from Safety Emergency Systems, Inc. incorrectly predicted the gas cloud would remain over the plant. The vendor denied its program was at fault and contended that incorrect data was fed into the model. Union Carbide acknowledged that substitute data was used for the chemical that was thought to have escaped.

Plant supervisors first thought toxic aldicarb oxime gas was released. Data was prepared for the model on only three chemicals, and aldicarb oxime was not one of them. So an operator made the closest approximation and entered data on that chemical.

In the confused, emotion-charged (remember Bhopal, India?) aftermath, it seemed logical to leap to the conclusion that the modeling program made the wrong prediction on the speed and direction the gas cloud would travel because the wrong data was entered. "Garbage in, garbage out," said Gary Gelinas, president of Safety Emergency Systems.

Or in the catchphrase solution to so many modern technological mysteries: "The computer did it."

We are quick to blame the bloodless, lifeless, carefully constructed interpreters of ones and zeros when lives are endangered or lost. A similar incident occurred recently when a glitch developed in a space shuttle launch. According to reports, faulty computers would have shut off the shuttle's engines and prevented the craft from ascending into high orbit had not human operators intervened and kept the shuttle climbing. The image was of computers run amok sending the astronauts plummeting helplessly back to Earth. But this time, the humans prevailed.

Computers haven't taken over yet. They're not smart enough. And, we need to examine our tendencies to give them more credit and more blame than they deserve.

For instance, we learned in a follow-up call to Union Carbide that a broken steam pipe may actually have caused the leak disaster. Runaway vented steam heated up a tank containing two chemicals, changing the state of the chemicals and increasing pressure in the tank. The operator could not identify the leaking chemical because he apparently had no idea that the chemicals had changed into different states in the tank. For want of a thermostat, perhaps, 135 people were hospitalized.

It may be good news that these recent press reports were initially off the mark. It is not encouraging, however, to recall how quickly and easily assumptions of guilt were made in the first place.

In reality, the Union Carbide incident demonstrated the seeming impossibility of programming for the unpredictable. It's like building the perpetual motion machine. Those in the computer community must take the lead in educating society that computers are limited to the assumptions built into their programs, just as Union Carbide's model was limited by the predictable.

LETTERS TO THE EDITOR

Bulletin board abusers don't rate protection of First Amendment

I must take exception to the editorial,"Hands off," [CW, Aug. 26]. In it, you expressed the opinion that computer bulletin boards should have First Amendment protection.

The computer system that I have responsibility for is currently under attack by a group of people accessing it via a public packet-switched network. The access attempts have come from all over the country, and the hackers have tried to sign on using standard vendor maintenance accounts. It is clear that the information about these accounts is on an underground bulletin board being used for criminal purposes.

Although we intend to prosecute the perpetrators when the Federal Bureau of Investigation catches them, I would have been happier if the problem had never existed. I am not at all amused by these "cute little bit bangers," and I will support any and all efforts to force them to behave lawfully, even if their instincts direct otherwise. The removal of temptations presented on bulletin boards seems to be a good start toward this goal.

Stephen M. Rush
San Francisco

■

The editorial, "Hands Off" [CW, Aug. 26], missed the point: Abuse of privacy and property by placing private information on computer bulletin boards is not a fantasy but a very real problem and one that did not exist before computer technology made private codes so critical and so easily and destructively disseminated.

Your position, which stated that because freedoms are often abused by some that the best policy is to ignore them, is surely not meant to be taken seriously. Legislators are hardly characterized fairly as "busybodies . . . poking around" when they hold as extensive hearings as are being held in California on issues on the public's agenda.

These abuses do happen. The Data Processing Management Association (DPMA) is concerned about them, and your newsweekly regularly reports them.

The bill that Sen. John Doolittle (R-Calif.) introduced in California does not limit any of the rights protected by the First Amendment. On the contrary, those rights are enhanced by being protected in a computer environment as they are in traditional media. There is no First Amendment right to invade another's privacy nor to encourage another to do so by publishing the access codes that would accomplish it.

Doolittle's bill addresses this concern and so does the DPMA proposal. The means differ, but the intent is the same.

Donald G. Ingraham
Alameda, Calif.

Manager defends function of memos to organize long-term group projects

Walter Cuirle's viewpoints expressed in "Minimizing the flow of managerial memos" [CW, Aug. 12] are interesting but need a different perspective.

There are several valid reasons for written memos. New ideas are easy to say and to listen to, but later on when action may be required, it is much better to refer to written notes than it is to trust one's memory. Status reports often contain a number of specific points of information such as solutions to past problems, changes in completion dates and so on.

I would certainly argue with some of the numbers that Cuirle uses to justify his recommendations. Two hours to prepare a one-page memo seems very excessive.

The thought of managing 10 people for one month on a project without written memos scares me. I can't always remember all the details of what I did last week let alone all the ideas encountered in a project of one month's duration.

As a manager, I can read, study and act on written memos and reports much more easily and quickly. Meetings are for questions, discussions and planning. At the end, a written summary of points raised and answered can be referred to for review, study and implementation at a later time.

I certainly can appreciate Cuirle's concern for the reduction in paperwork and managerial time. However, the particular examples and recommendations he gave could only encourage less than adequate control that in turn would result in less than satisfactorily completed projects.

Ted Farrell
Albany, N.Y.

For more letters, turn to page 22

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VIEWPOINT

Ruminations on communications

LECHT ON SCIENCE
Charles P. Lecht

Let me begin by stating that I've always thought of AT&T as being extremely fair in its practices, and I was against its dismemberment and still feel it to be one of the finest companies in the U.S. or anywhere else.

Nevertheless, one cannot overlook the rising cost of communications at a time when competition is supposed to be bringing it down. Consider the cheery human voice that ends long-distance noncredit card calls with "Thank you for using AT&T." Although I confess to not knowing the real number of these messages, I'll go out on a limb and state that they number at least a million a day — the U.S. has more than 150 million telephones so I feel safe in my guess. At no less than three seconds and sometimes as much as five seconds for each "Thank you for using AT&T," the suggestion that these consume at least four million seconds of valuable telephone time daily is unquestionably conservative.

Supposedly you can use one of the alternative services that make you dial another number before you dial the one you want or others that make you dial so many numbers for one call that you deserve a medal for doing it right the first time. But these are too demanding as far as I'm concerned: 10 numbers is as many as anyone I know can handle without having to redialing after getting someone in Zambia by mistake.

No, friends, I'm not going to file a petition to remove the "thank yous" from our telephones — courtesies are hard enough to come by these days, sincere or not.

A maze of menus designed by a robot

What I am concerned about is what's next. And not only from AT&T. Already MCI Mail insists on giving the day's headlines and a lot of advertising when I sign on, and then takes me through a maze of menus that must have been designed by a robot for a robot with part of the former's circuitry missing — all this in my office in Japan while I'm trying to send a simple message to New York.

The headlines and advertising take 12 seconds. Whether or not this is directly billed to me is never clear, but I'm old enough to know that, as the saying goes,"You don't get anything for nothing in this world." Someone's paying for the creation and transmission of the headlines, the urgings to send a telex or two and the sales pitch for Dow Jones — all of which preceeds the question of why I signed on to the system in the first place.

> ”
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> *It's hard to swallow the promises of those that resell AT&T's service; AT&T still makes and sells it best. Why else would virtually all of the U.S. be on it?*

On weekends, I get announcements of specials. You know, the kind that we expect to find on the windows of our local deli, but in this case, I'm paying the rent of the window space.

I could go on to mention other systems that insist that I spend my bucks on similar stuff, but it might just bring watchdog lawyers out of their kennels to bark up a storm of indignation based on their arguments on humanity's moral right to switch services if one or another doesn't suit them. Of course, the fact that there's still nowhere to switch to, especially if you want to cross a state's boundary that isn't in our national telecommunications network — a euphemism for AT&T's core business long-lines facilities — is hardly noticed.

It's hard to swallow the promises of those that resell AT&T's service; AT&T still makes and sells it best. Why else would virtually all of the U.S. be on it, including IBM? From my perspective, the pushing of advertising and news on the non-AT&T networks signals that there are still no non-AT&T networks — that is, competition — in our communications industry. How else could our alternative network services purveyors get away with it?

The lessons we learned in the mainframe computer industry wherein others tried to compete directly with IBM by piggybacking on the things IBM did best, namely making IBM computers, cannot be forgotten. Sure, we saved a buck or two by buying the alternatives, but when the whole picture was put together, unless we really knew what we were doing — for example, buying an Amdahl Corp. mainframe to add processing power to an otherwise IBM system — we were bound to lose out on the deal. The ex-customers of RCA Corp. and Univac can attest to this.

Buy away, my friends. But if the system thanks you too much for doing so or gives you news you've already read at breakfast, watch out. You are paying for it.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Squeezing CPU power: Is the effort worth the return?

THE DATA CENTER
John P. Murray

No matter how well the technical support group does its work in monitoring and fine-tuning information processing hardware resources, and no matter how extensive the factual basis for providing justification to move to a larger mainframe, it can still be difficult to convince senior management of the need to do so.

The facts supporting the need can be marshaled and presented in the most businesslike manner possible, and yet senior management will deny the request. It is likely that the denial will be accompanied by directions to squeeze more out of the installed hardware.

In some instances it is possible, even after a considerable amount of fine-tuning has already been done, to obtain a bit more processing capacity from a heavily loaded mainframe.

An important question should be raised in such a circumstance — notwithstanding management's directive to do more with the current hardware: What is the real cost of attempting to gain that probably minor benefit?

Provided that the system is indeed well tuned and that it is operating at a high level of efficiency, significant gains in throughput in a particular area are probably going to be obtained at the expense of some other area. On a net basis, the difficulty or inconvenience experienced in one area may be more than offset by the gains produced in another area.

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> *Although there may be some political benefit to being able to inform senior management that the instructions to squeeze more out of the system are being followed, the use of a cost-return ratio might demonstrate that the actual value of the effort is questionable.*

If the issue of fine-tuning the hardware resource is appropriately addressed, a considerable portion of the total gain to be realized can be obtained early with a rather limited effort. Given the proper advanced planning and analysis, 20% of the total effort can produce 80% of the total return.

This is the case because much of the total benefit will often be found in major areas; if these areas are addressed first, the gains can be substantial.

Getting results from other areas

Once the more prominent problem areas have been addressed, getting results from other areas will take a great deal of time and effort. And the potential results are going to be questionable in terms of the return on that effort.

Although there may be some political benefit to being able to inform senior management that the instructions to squeeze more out of the system are being followed, the use of a cost-return ratio might demonstrate that the actual value of the effort is questionable.

If such fine-tuning impedes or reduces a particular department's productivity, the value of any gains realized after the initial 80% or so would have to be questioned.

For example, an adjustment may be made to provide more resources for batch processing. In a heavily loaded system, this probably means that on-line processing receives fewer resources.

Although the net effect may seem, and may indeed be, rather small, spread over a large active network, the result in terms of lost productivity and lowered morale may be significant. It may well be that the adjustment, while speeding up some of the batch processing, will reduce overall throughput.

Minor increase put to better use?

One must ask if the time spent in obtaining this rather minor increase in hardware efficiency could be put to better use somewhere else. The net return on the investment of this time might be much greater if it was devoted to other areas.

The decline in the cost of raw processing power continues. Given that continuing decline, the issue may not be whether there is unused processing power, but whether the potential return is worth the effort expended to harness it.

If, indeed, a 20% effort will produce an 80% return, can an additional 30% or so effort be justified to produce another 5% return? Every installation must make its own decision, but the answer is clear.

Murray is director of management and information services for American Breeders Service, a DeForest, Wis., division of W. R. Grace & Co. and is the author of Management Information Systems as a Corporate Resource.

Apprenticeship in DP shops guarantees high quality

READER'S PLATFORM
Bo Sanden

A certain basic structure is taken for granted in most DP organizations: On the one hand, there are managers who are not really supposed to be involved in technical matters other than to receive reports and so on from the technical staff.

There may be reports of technical solutions as well as progress reports, but the manager is not expected to solve technical problems, only to understand the issues when they are presented. The manager works with administrative tools such as assignment of people, adjustments of plans, budgets and so on.

The technical staff, on the other hand, is supposed to concentrate on the purely technical issues and not to manage. Sometimes, a dual career is implemented whereby technicians can be promoted to technical positions on a par with management positions but notably as system experts. This normally implies a high degree of specialization in particular systems or techniques.

The type of organization where this occurs is probably based on traditional manufacturing where the main objective is to control large-scale production that is not very complicated. The main issue is to manage large groups of people, to motivate them and to provide career paths.

By contrast, I like to see the approach in the time-honored tradition of creative crafts, which is very appropriate because there is always an important creative element in software design.

The traditional organization in these trades is based on masters and apprentices, often with certain steps in between. The master is the manager but also the technical authority and the instructor.

Unlike that of a technical expert, the important characteristic of the master is not in-depth knowledge of a given system. That sort of necessary expertise can be delegated. Rather, it is general design experience and acquired skill, which are more generally applicable.

There are several advantages with this approach: First, it is highly motivating. To the young apprentice with a technical interest rather than administrative ambitions, the master is a professional guide as well as a role model. To the senior technician, it is a way to continue working wih the technique while eschewing the boring details.

Over the years, the distance to the actual development terminal increases as does the distance to the program code. This prevents burnout. The master is not a chief programmer but is in charge of delegating the details.

Second, it guarantees quality. The master can assume the responsibility for the conceptual integrity of the large system. The approach economizes the scarce resource of senior technical talent. Just as important, it makes quality a central issue.

Today, quality is often the concern of a separate quality department rather than of the line or project organization. As the technician sees it, quality is rewarded with prizes and pats on the back, and promotion is based on completely different criteria. The career of the master, however, is built solely on professional skill.

Communicate and clarify questions

An integral part of this skill is the ability to communicate and clarify technical questions. The existence of a master promotes the discussion of technical issues within the development group.

Contrary to the common belief that programmers are loners who prefer not to share a solution with anyone until it is finally coded, in actuality even the most reticent programmers love to discuss technical problems.

The real reason why technical problems are not discussed is that nobody wants to listen. Colleagues are busy with their own problems, and the administrative manager is neither competent nor interested. The true master, however, will welcome the opportunity to provide guidance, mildly enforce relevant standards or concepts or simpy tackle an interesting problem.

Another advantage is that technicians will receive competent feedback. However well intentioned, the administrative manager will base judgment on the word of others or on the compliance with plans and may easily overestimate a mediocre job in a critical project. At the same time, the manager may let an outstanding effort in a smoothly running project go unnoticed, simply because the work is so well done that the project never becomes critical and, therefore, never draws attention to itself.

The master, on the other hand, would hopefully be knowledgeable enough to judge each task on its own merits and be able to distinguish the difficult ones from the easy ones.

Continued on page 22

Sanden is in charge of a distributed systems project at Philips Data Systems in Monterrey, Mexico.

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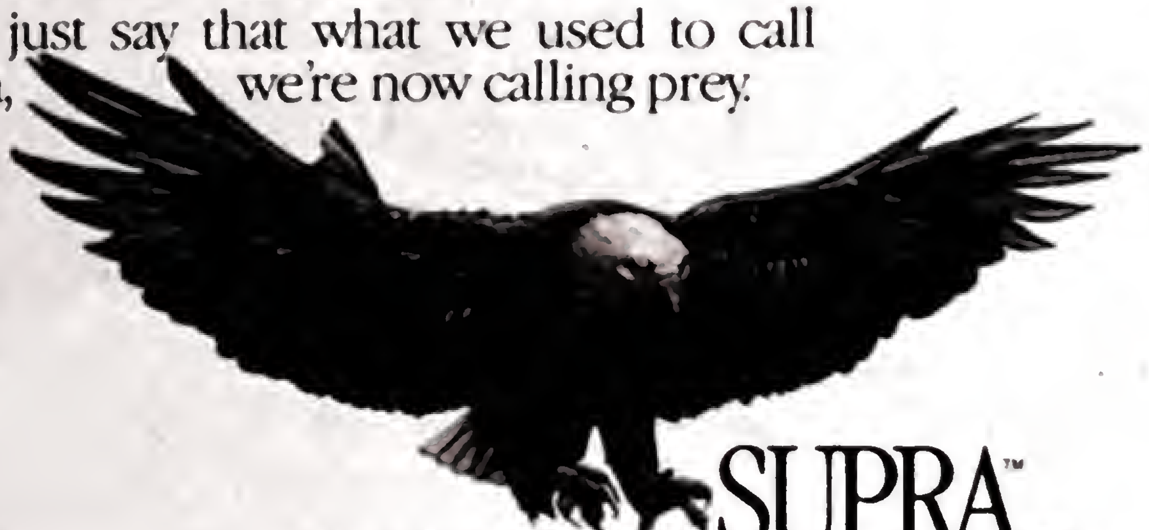

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LETTERS

Microprocessor comparison misleading with Mips figures

The article, "Chip vendor representatives wield claims at NCC session" [CW, July 29], in which technically well-qualified panelists at a technical session representing four major microprocessor manufacturers described and compared their products, is incomplete in a way that makes it seriously misleading.

The reader finishes it believing that the panelists presented their microprocessors mainly in terms of million instructions per second (Mips), a simplistic, would-be measure of processing power, and made emphatic — if not belligerent — claims of superiority based on it.

In fact, the panelists, all of whom were apparently involved in the design of their products, spent by far the greater portion of their time on the technical features of their CPUs and the associated coprocessors and instruction sets.

Computerworld's audience needs timely information about advances in the art of microprocessor design and about how those designs are evaluated. Information regarding the inadequacy of widely touted Mips figures, particularly when designers themselves publicly deemphasize Mips evaluations, deserves to be noted.

William J. Clover
Chicago

Two-vendor shop provides no guaranteed solution

The article, "Choosing and using consultants," [CW, Sept. 2] was amusing and sad. It stated that an IBM representative decided that a particular shop needed to become a two-vendor shop. I cannot think of a single problem that is solved just by becoming a two-vendor shop.

The sad part is that a company would hire someone from IBM to come into a non-IBM shop to make recommendations. Do they really believe the representative is not going to recommend changing to IBM hardware? That is like going to a Ford dealer to help you choose between a Ford and a Chevrolet.

Bruce Powell
Port Arthur, Texas

From page 18

DP apprenticeships guarantee high quality

All these requirements of the master may seem like a large order, and obviously, the master's tasks are not easy ones. Masters are not just any people who have been around for a while. They must certainly have a genuine technical interest and an urge to continue developing technically.

Given that, the other qualities can be acquired. There is a very natural path leading from the hands-on design of small programs to bigger programs to the design of large systems by means of specifications or other abstract tools, with the details delegated to others.

The ability to communicate technical issues develops in parallel, beginning with the reviews or presentations of one's first programs, if supported by the organizational culture. Finally, a growing interest in working with other people in delegating tasks is part of human maturation.

The master-apprentice organization does have a certain patronizing character, and one might think that this would be resented by apprentices. My experience, however, is that it will not, because of the technical authority of the master as well as the difference in work experience that will normally exist. People with a technical interest will respect a person who can provide concrete advice and suggest viable solutions to technical problems.

A different situation often exists today. Because of the rapid technological changes, many technicians who are fresh from school suddenly find themselves supreme authorities of some part of the technology, especially in small organizations where nobody has had the time to master the latest novelties. This may be challenging to a highly talented individual, flattering perhaps to others, but in general, it is not very healthy.

Inventing devices to cope

The young individuals will have to invent their own devices to cope with the technique. There will be no role model, and the only nonadministrative career presenting itself is extreme specialization in the particular technique, which may not always be a very attractive prospect.

Masters exist in many places. Perhaps we do not hear very much about them simply because good results are produced without much ado. Also, perhaps managers count themselves fortunate having a talented and experienced individual in the organization and do not realize that mastership can be cultivated. There is no lack of potential masters and young talent in need only of the right kind of support and guidance.

Maybe masters are particularly common in the academic world, which probably attracts more technically oriented and less career-oriented individuals than industry. Probably the existing management philosophy of industry hinders the development of masters. It may, however, be necessary to change the paradigms and recognize software development as a creative craft, not only to improve dramatically the general quality of software but also to create a more motivating environment and thus solve the problems of excessive manpower turnover.

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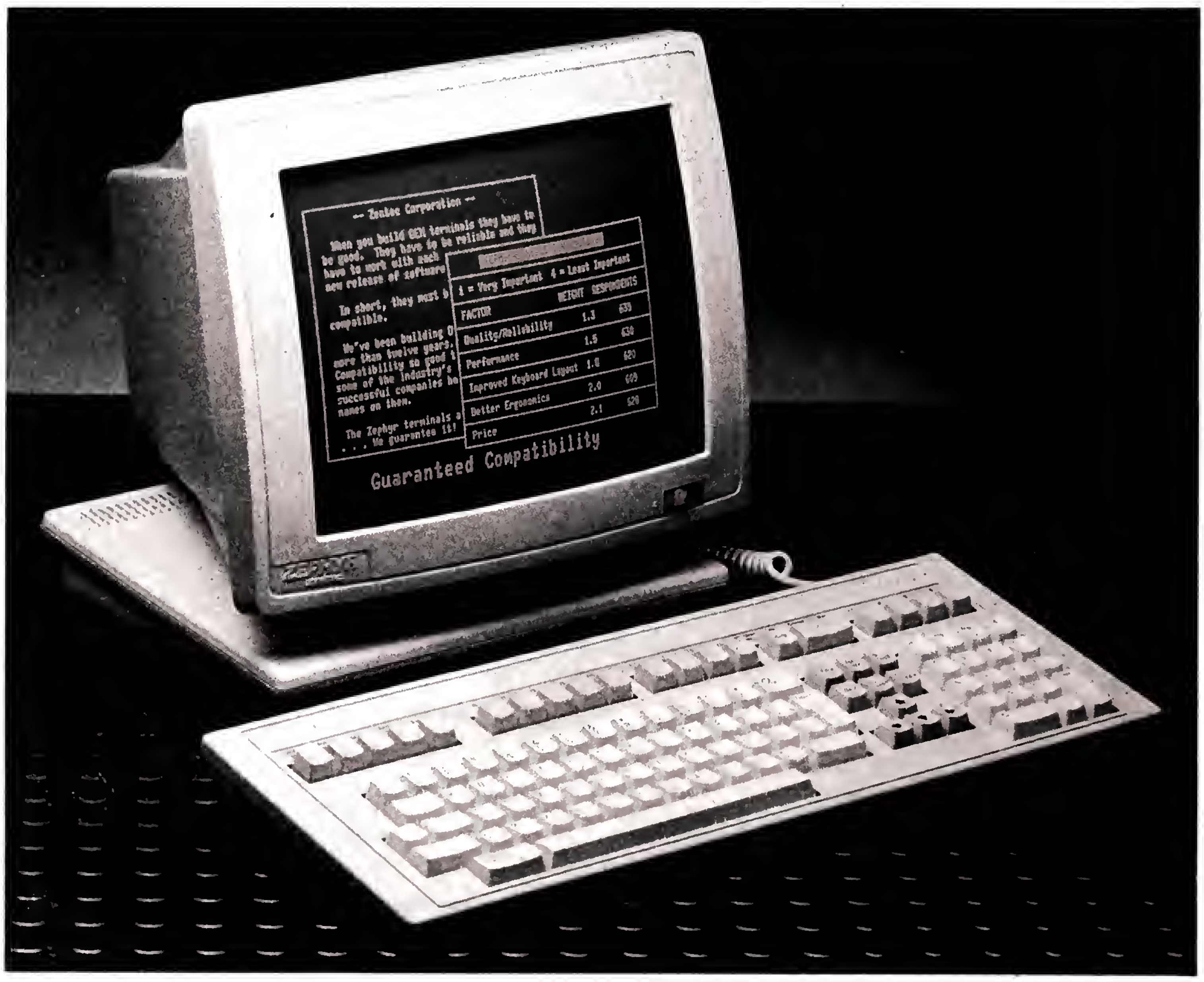

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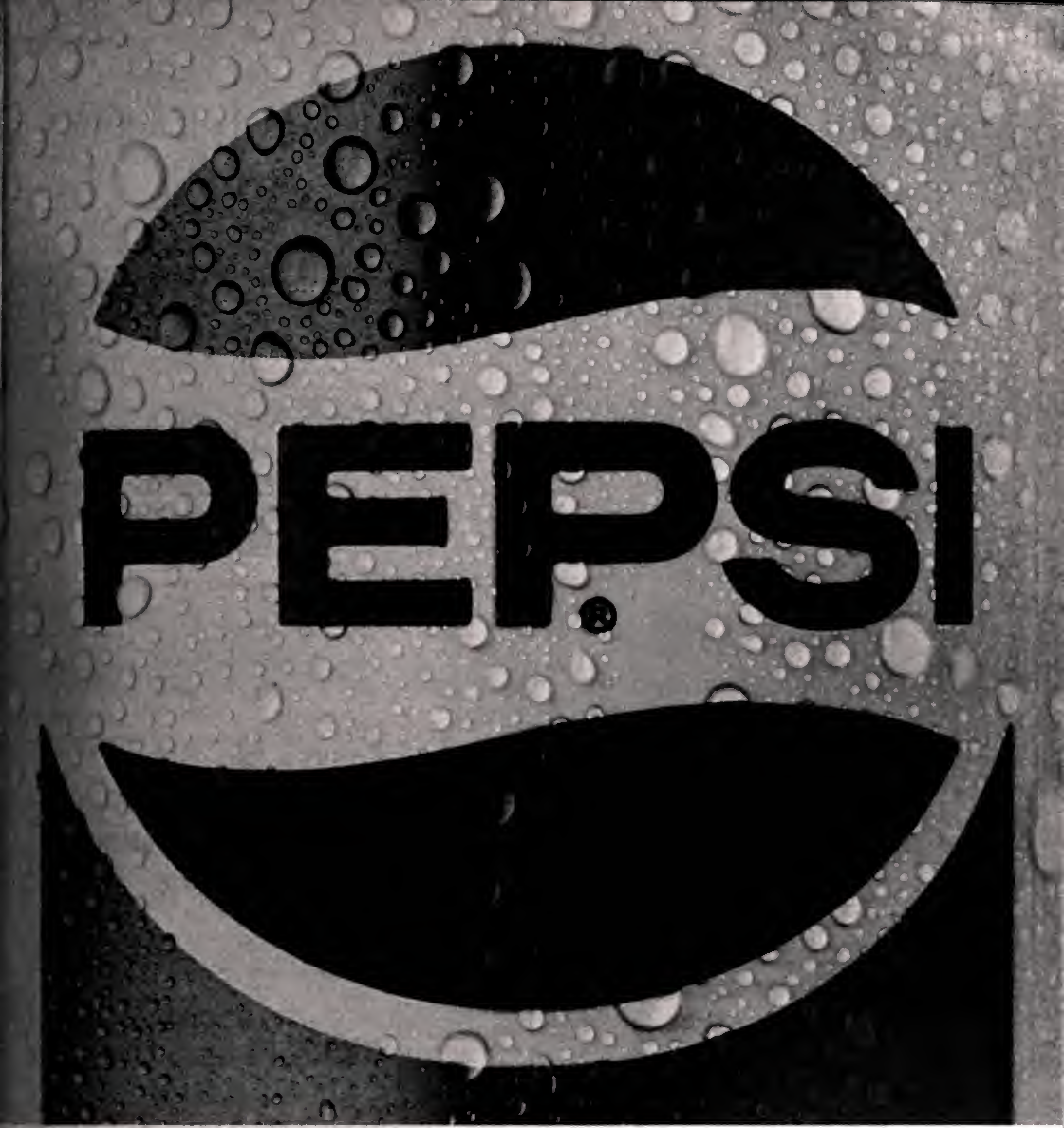

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Employment figures reflect trend toward efficiency

By Clinton Wilder

Employment levels of most major mainframe and minicomputer vendors declined or grew only modestly in the first half of 1985, reflecting both this year's industry slump and a trend toward more efficient manufacturing.

The worldwide work force at Control Data Corp. is at its lowest level in nearly eight years, having shrunk by 3,720 positions since Jan. 1 and by more than 10,000 jobs since 1981. Burroughs Corp. has been the year's other big job loser among the Bunch companies, with more than 2,000 employees laid off, chiefly in administration and production, in accordance with Chairman W. Michael Blumenthal's long-term consolidation plan.

At financially troubled CDC, the sale of subsidiary Magnetic Peripherals, Inc. production facilities in Minnesota, Texas and Kentucky slashed 900 positions, the largest single component of a domestic work force reduction of 3,400 since Jan. 1. CDC's worldwide employee population of 50,400 as of June 30 was its lowest since the end of 1977. Most of the cuts have taken place in production jobs, and CDC is not adding employees in other areas, according to spokeswoman Susan Bush.

Employment levels

		Jan. 1	June 30	% Change
Burroughs Corp.	U.S.	Not available		
	World	65,300	63,000*	-3.5
Control Data Corp.	U.S.	44,430	41,030	-7.6
	World	54,120	50,400	-6.7
Data General Corp.	U.S.	13,030	11,875	-8.8
	World	17,800	16,690	-6.2
Digital Equipment Corp.	U.S.	59,600	59,300	-0.5
	World	88,600	89,000	+0.4
Hewlett-Packard Co.	U.S.	56,000	57,000*	+1.2
	World	82,000	85,000*	+3.6
Honeywell, Inc.	U.S.	Not available		
	World	94,270	93,620	-0.7
IBM	U.S.	239,000	242,000	+1.2
	World	395,000	402,000	+1.8
Prime Computer, Inc.	U.S.	Not available		
	World	7,420	8,100**	+9.1
Sperry Corp.	U.S.	27,900	27,800	-0.3
	World	36,900	36,800	-0.2

* Figures for Sept. 1.
** Figures for Aug. 5.

Source: CW Communications, Inc.

Most employment levels declined or grew only modestly.

IBM work force

At the other end of the spectrum, the work force continues to grow normally at IBM, the world's second largest industrial employer behind General Motors Corp. With 402,000 employees worldwide as of June 30, Big Blue grew by 7,000 employees in the first two quarters, consistent with its annual employee growth rate of 10,000 to 15,000 during the last several years.

The U.S. work force increased by 3,000 employees in the period, also a normal IBM growth rate, for a total of 242,000. "Hiring is proceeding across the board," spokeswoman Maxine Yee-said. "Even though our profits have been lower than in past years, that hasn't connected to our employment figures."

The profit margins of Digital Equipment Corp. have also held up reasonably well during the current slump, but DEC has slowed its domestic hiring to a trickle and has reduced its manufacturing force. The U.S. work force expanded by 6,600 in the final nine months of 1984 but remained level between Jan. 1 and July 1 of this year.

Like Burroughs, DEC is in the midst of a long-term job reduction plan, but DEC's plan focuses specifically on the production area. Planning for smaller machines and more efficient, automated production lines, DEC has trimmed 3,000 manufacturing positions since the beginning of 1984. Another 2,000 cuts are planned in the next one to two years to reduce production employment to 25,000 worldwide from a high of 30,000 two years ago.

"As our computers get smaller and more powerful, they need fewer people to build them," said DEC spokesman Jeff Gibson. "Fewer materials means fewer people to move the materials and fewer people to schedule them. When someone leaves the company in production, we're often revamping the process instead of filling the position."

The same type of elimination by attrition has hit large vendors' middle management jobs in the current downturn, according to one leading executive headhunter. "The middle management ranks have been severely hurt in this retrenchment, and I think those jobs are gone forever," said William Tholke, managing partner of the Korn/Ferry International executive search firm in Palo Alto, Calif. "Companies have identified a lot of duplication and are finding they can do without many of those positions."

Employment levels in so-called revenue-generating positions — direct sales, service and support, for example — have generally been spared the layoff axe. "But

Continued on page 26

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Ada gets Nasa nod for space station use

By Mitch Betts

Ada, the programming language of choice with the U.S. military, recently gained another convert. The National Aeronautics and Space Administration will use Ada in the on-board flight systems of the manned space station project scheduled for launch in 1992.

Nasa is the first nonmilitary U.S. agency to use Ada, the high-order language developed for the U.S. Department of Defense, according to U.S. Air Force Maj. Allan H. Kopp, a deputy director of the Pentagon's Ada Joint Program Office, which monitors Ada developments.

The advanced language may also be used in the operating systems and applications of an advanced air traffic control project that is being designed for the Federal Aviation Administration (FAA), *Computerworld* has learned.

Nasa's Space Station Project Office at the Johnson Space Center in Houston selected Ada as the language for flight subsystem applications programs on the space station. Furthermore, officials said Ada is a candidate for the space station's ground control computers as well.

Liana Burke, a software manager at the Johnson Space Center, said Ada was selected because it is the most robust and modern language, because Ada compilers have been developed in the private sector, and because the Pentagon's support for Ada "gives us a degree of confidence in its long-term viability."

Commenting on the selection, Kopp said, "I think it clearly indicates that Ada is moving outside the realm of the Department of Defense into other government applications."

Kopp added that the Nasa action will have "ripple effects" on the computer industry. "It will mean that contractors doing business with Nasa will have to know Ada. It will mean the vendors who support those contractors with computer hardware and software will have to have Ada capability," he said.

Meanwhile, the Ada programming language is a leading candidate for use in advanced air traffic control software at the FAA, according to government and industry sources.

The firms competing for the FAA's Advanced Automation System contract, IBM and Hughes Aircraft Co., are both using Ada design tools in the early stages of the design process, a well-placed government source confirmed. Moreover, Ada is a strong candidate for use in the actual operating systems and applications software, if a mature compiler and trained personnel can be found to implement it, the source added.

In addition to Ada's reputation for modularity and low-cost maintenance, Ada makes a good choice for the FAA because of its error-free code and high reliability — important features for collision-avoidance systems, government and industry sources said.

Last year, the government awarded contracts totaling $246.7 million to IBM and Hughes for a three-year competition to design the advanced air traffic control system [CW, Sept. 3, 1984]. The contractor with the best design will get the production contract, with delivery beginning in 1989.

Ada already is the standard language for critical military computers at the DOD. The North Atlantic Treaty Organization recently announced it will implement the Ada language in all military systems, beginning in January 1986, according to Maj. Kenneth Schoonover, Ada project officer for the Air Force Systems Command, who spoke at the recent Federal Computer Conference in Washington, D.C.

However, the U.S. Postal Service (USPS), which last year planned to use Ada software for mail-sorting equipment at two bulk mail centers [CW, Aug. 20, 1984], ultimately did not use Ada.

According to Frank A. Amoroso, a USPS program engineer, those plans went awry when contractors, claiming that adequate Ada hardware and software were not available in time, substituted software products operating under AT&T's Unix system, which uses the C language.

From page 24

Employment figures show efficiency trend

that has been curtailed — we're hiring, but it's not wide open," DEC's Gibson said.

Overall, DEC added 400 employees between Jan. 1 and July 1, all of them overseas, for a worldwide employment total of 89,000. The U.S. work force remained relatively stable, falling by 300 for a total of 59,300.

More than two-thirds of Prime Computer, Inc.'s 8% work force increase since Jan. 1 has been in sales and research and development positions. The Natick, Mass., minicomputer maker expanded by 680 jobs for worldwide employment of 8,100 as of Aug. 25.

Hewlett-Packard Co. has seen increases of 1,000 domestic and 2,000 overseas employees in 1985, with no particular concentration in specific job functions.

Two Bunch mainframe companies, Sperry Corp. and Honeywell, Inc., have experienced a modest decrease in employment since the beginning of the year. Honeywell's worldwide job total fell by 650 positions to 93,621 as of June 30.

At Sperry Corp.'s Information Systems Group, a slight increase in domestic employees in the first seven months of 1985 offset most of the loss of 600 laid-off production employees at the Sperry terminal and communications equipment facility in Salt Lake City, for a total of 36,800 employees worldwide and 27,800 in the U.S. as of July 31.

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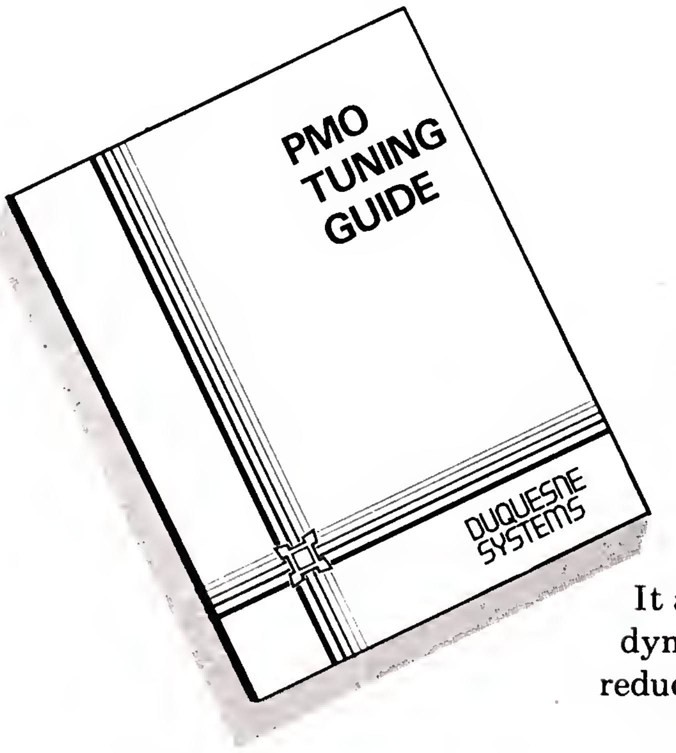

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Martin urges MIS managers to automate operations

By Charles Babcock

NEW YORK — Management information systems managers need to put more automation into their operations with engineering-style techniques, according to James Martin, the noted author and commentator on information management.

In a recent address to Cadre, Applied Data Research, Inc.'s users group, Martin described how information engineering will bring about a leaner, more end-user-driven corporation in the 1990s.

Martin said the modern corporation will be structured on a knowledge base composed of all data and rules pertaining to the business. The chief resource of the knowledge base will be an encyclopedia in which integrated models of data, the enterprise and the processes that run it are stored and cross-referenced.

> ”
>
> *The modern firm will be structured on a knowledge base composed of all data and rules pertaining to the business.*

The emerging techniques of artificial intelligence, when applied to the knowledge base, will be able to correlate the information and use the rules in many stages of decision making, he said.

To get to this point, however, MIS managers will need to use more disciplined techniques that lend themselves to manipulation by computer logic. Many MIS professionals worry that automation in their field could jeopardize their careers, but they should not, Martin noted.

"It's much more fun to work with power tools than hand tools," he said.

To move toward automation, MIS managers must minimize some current careless practices, such as incorporating the imprecise communications of English language specifications into program designs.

Much of Martin's talk addressed diagramming program specifications, a topic that has occupied his recent attention and is the subject of a forthcoming book.

"Diagrams have got to have the precision of a computer language. They are a computer language," he maintained. Precision diagrams will allow automated conversion of data flow diagrams into data navigation diagrams, decomposition diagrams and more, he said.

Bit-mapped personal computers like the IBM Personal Computer AT allow much more precise diagramming and give software developers a tool that yields a much quicker response time than a terminal, he noted.

Building a prototype early in the application development process would yield greater productivity, according to Martin. "I have never seen an example of a prototype being given to end users without end users changing it. So if you build a system without a prototype, you are probably going to build it wrong," he said.

Martin urged his listeners not to underestimate the role that artificial intelligence will play. AI is no "genie coming out of the bottle," he said, but its ability to apply a set of rules to a large body of data will make it a valuable component of the firm of the future.

That cannot happen while AI is the subject of a kind of cult following that needs specialized computers to run its programs, according to Martin. "You want to lift it out of its subculture and anchor it in the world of IBM and MIS," he said.

Information engineering, he concluded, will push MIS away from manual techniques and toward automated techniques. "This makes so much sense that every efficient corporation will do this" by the 1990s, despite massive migration problems, he said.

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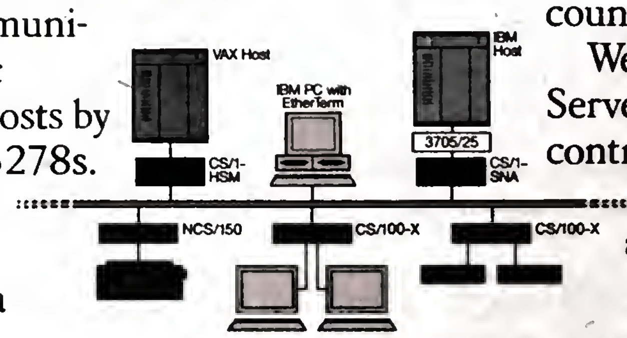

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IBM's Opel calls for competition in foreign telecom nets

By Jeffry Beeler

SAN FRANCISCO — IBM Chairman John Opel last week called for foreign governments to open telecommunications networks to the free-market dynamics that have fostered advances in the U.S. information processing industry.

"Competition must increasingly govern . . . an industry segment with which information processing is converging — telecommunications," Opel said during the eighth quadrennial International Industrial Conference.

"Historically the telecommunications networks of the world have existed under noncompetitive arrangements — as franchised monopolies owned or tightly regulated by government," Opel said during the conference luncheon address.

Within the last few years, however, governments have begun to retreat somewhat from their traditional monopolies and to push their telecommunications industries steadily toward deregulation. The process is already nearly complete in the U.S. and appears to be gathering momentum in several other countries as well.

"Britain has liberalized its policy," Opel told some 500 conference audience members representing more than 60 nationalities. "So have Canada and, to some extent, Ireland. Japan has passed legislation ending its traditional monopoly system with the intention of opening the telecommunications market to competition. Other countries are actively debating similar changes."

The worldwide movement toward deregulated telecommunications promises to yield significant benefits, Opel maintained. "Competition not only will continue to propel the growth of information processing," he said, "it also will power new growth in telecommunications. And it will bring both industry segments together in a flourishing $2 trillion marketplace before this century ends."

IBM Chairman John Opel called for worldwide deregulation of telecommunications.

In information processing, free enterprise has already fostered dramatic price/performance improvements and has otherwise fueled breathtaking technological advances, Opel said.

To underscore his point, he contrasted the recent histories of the information processing and telecommunications sectors. Since 1955, the execution rates for general-purpose processors have grown by a factor of 938, while the associated costs have dropped by a factor of 234.

In the telecommunications field, by contrast, a Tokyo-to-San Francisco telephone call that cost $17 in 1968 carries a $7 price tag today. "That difference in performance [between the information processing and telecommunications industries] reflects the price exacted by regulation, which, among other things, inhibits the abandonment of obsolete equipment for new [equipment]," Opel said.

Competition in the information processing industry has also "made an anachronism of artificial national regulatory barriers," promoted the development of international standards and blurred the distinction between what should and should not be regulated, he said. Similar changes are expected to accompany the ongoing deregulation of telecommunications networks.

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WASHINGTON UPDATE
CW Washington Bureau

U.S. representative assails nine-digit Zip code program

WASHINGTON, D.C. — U.S. Rep. Glenn English (D-Okla.), a critic of the U.S. Postal Service's (USPS) nine-digit Zip code program, recently said the USPS should place more reliance on new optical character recognition (OCR) and bar-code equipment for mail sorting.

English, chairing a Sept. 13 hearing by the U.S. House of Representatives Subcommittee on Government Information, Justice and Agriculture, told USPS officials, "The focus should be on automation" rather than on the Zip + 4 program to reduce mail-sorting costs at the quasi-governmental agency.

The USPS recently announced it will begin testing multiline OCR equipment that can read the entire address on an envelope and print a bar code on the lower part of the envelope. At the same time, the USPS announced it will increase the discount that business mailers get for using the nine-digit Zip code [CW, Aug. 19].

English said the new equipment will make Zip + 4 obsolete, but USPS representatives disagreed. "This move toward multiline readers does not in any way lessen our commitment to Zip + 4," testified Jerry K. Lee Sr., senior assistant postmaster general.

"Deployment of the multiline readers over the next several years will enable the Postal Service to increase near-term automation-related savings while Zip + 4 volume continues to build," Lee said. "In the long run, the Zip + 4 code, coupled with multiline equipment, promises to provide the highest productivity gains for the Postal Service."

English said he has long urged the USPS to implement an automation program first, then consider a longer Zip code if that is cost effective. English charged that the Zip + 4 program has been mismanaged and that further discounts to mailers are an unnecessary subsidy.

Joint venture to offer packet network service

SAN DIEGO — A gaggle of unlikely partners has joined forces with the intention offering a packet-switching service later this year, it was announced at the Telecommunications Association 1985 show last week.

At the conference, MCI Communications Corp., Amdahl Corp., Pacific Bell, Security Pacific Data Transmission Corp. and Dow Jones News/Retrieval service demonstrated a service capability that may be ready as early as this winter.

While traditional packet-switching carriers such as GTE Telenet Communications Corp. and McDonnell Douglas Automation Co. supply users with end-to-end services, this joint effort will have different companies providing network link segments and components.

In the demonstration, Pacific Bell and Security Pacific provided local-exchange packet connections to Dow Jones over an MCI long-distance link. Amdahl provided the network management processors, network concentrators and other components needed to access the packet net.

The joint venture plans to build networks for private customers using local-exchange packet nets interconnected with packet links from MCI.

NBS announces development of data dictionary standard

GAITHERSBURG, Md. — The National Bureau of Standards (NBS) recently announced that it will publish a standard for data dictionaries used in information systems of the U.S. government.

The announcement said the NBS will make the proposed Ansi standard on information resource dictionary systems a new Federal Information Processing Standard to promote portability of data among government users.

A preliminary cost-benefit analysis estimated that the U.S. government would be able to save more than $120 million, in constant 1983 dollars, by the early 1990s by using a standard data dictionary, according to the NBS.

In addition, the NBS announcement reported that a set of automated validation tests is currently under development.

DOD encourages ATM banking at military bases

WASHINGTON, D.C. — The U.S. Department of Defense recently proposed new regulations that encourage banks and other private financial services to open facilities — including automated teller machines — at DOD bases for military personnel.

The proposal stated that, although branch offices of banks, savings and loan associations and credit unions are preferred, ATM kiosks are permitted when full-scale financial services cannot be provided.

"In acquiring [ATM] services," DOD added, "preference shall be given to proposals that offer shared-access ATMs."

Public comments on the proposed rules are due Oct. 23.

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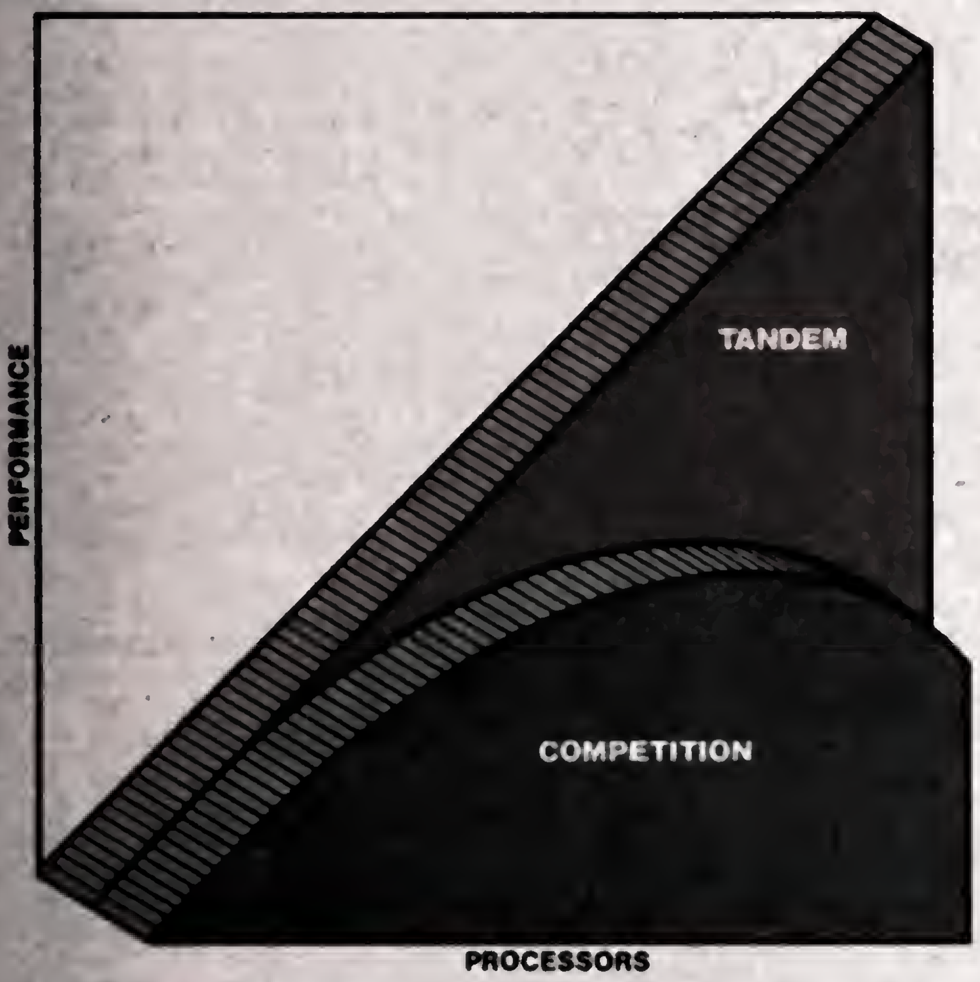

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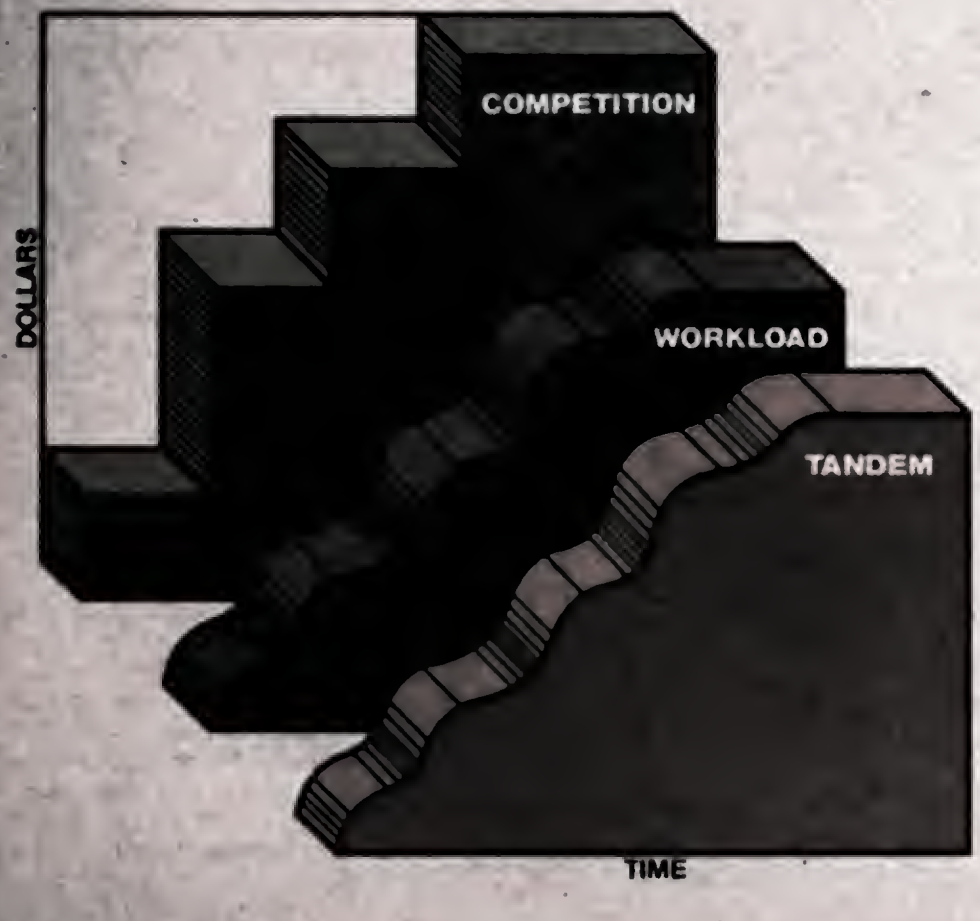

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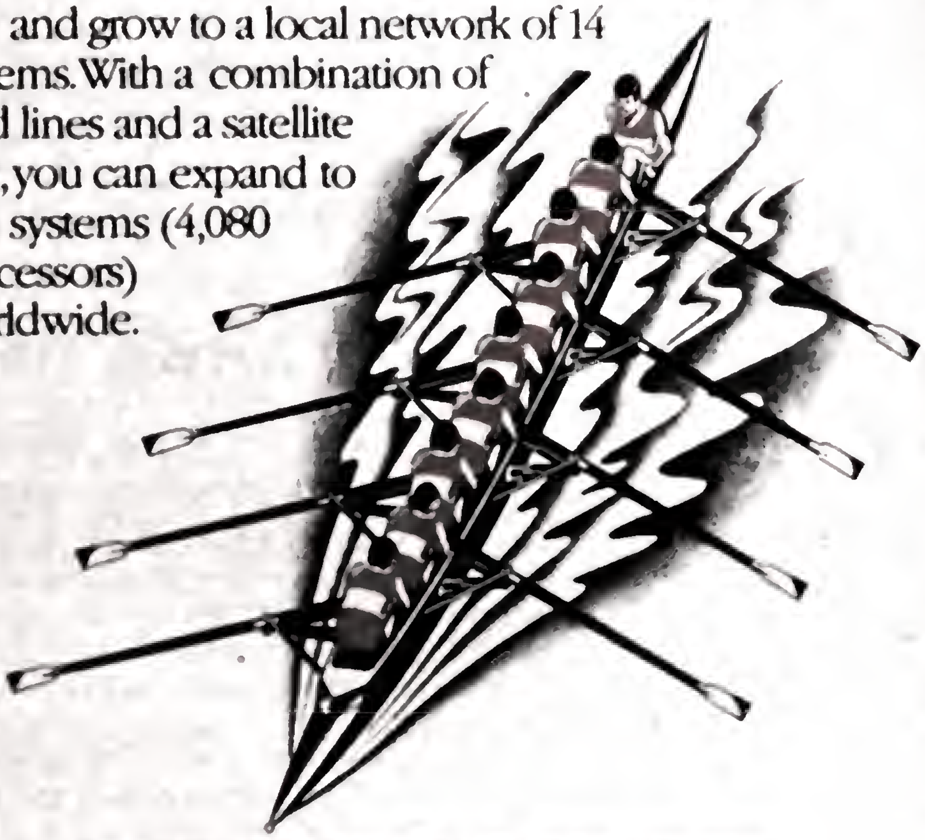

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TANDEMCOMPUTERS

Federal historians alarmed at loss of computerized data

By Mitch Betts

WASHINGTON, D.C. — Government historians and records managers, upset by the loss of computerized government data, vowed at a recent meeting to take a more aggressive role in shaping information management policy.

The meeting, hosted by the Society for History in the Federal Government, featured complaints from records managers and archivists at federal agencies:

■ Information systems are rarely designed with any input from records managers and archivists, who must retrieve historically important information 30 or more years after it is stored.

■ Records managers in the government are placed far below DP managers in the information management hierarchy and get little respect or resources.

■ The U.S. Congress has given an alphabet soup list of agencies that have the authority to manage federal records, but strong policy direction is lacking.

Generally, records managers and archivists need to retrieve and store certain types of government information, such as analytical reports, precedent-setting agency policies and directives, minutes of board meetings, legal opinions and comments on legislation.

According to a blue-ribbon panel called the Committee on the Records of Government, the computerization of government records has caused several problems, including the deletion, caused by word processing software, of historically significant first drafts of policy documents.

Consequently, "the U.S. is in danger of losing its memory," the committee's recent report said. Because of erasures of electronic records, future historians may know less about the 1985 arms control talks than about the 1972 Strategic Arms Limitation Talks, it said.

Furthermore, the growing use of electronic mail makes it less likely that important government memos will be preserved, the report said.

Frustrated with these problems, participants at the meeting said a government agency or committee is needed to set information policy. Anna Nelson, who was project director of the committee report, said a high-level records council is needed to coordinate policy along with the National Archives and Records Administration.

WORLD DIGEST
CW International
News Network

MANILA — As part of a sweeping effort to computerize government offices, the Philippine's President Ferdinand Marcos has eliminated the country's $50,000 ceiling on the importation of computer equipment, reduced tariffs on those products and established a cabinet subcommittee to review the status of computerization.

The subcommittee, headed by Prime Minister Cesar Virata, is responsible for formulating a plan to boost technological development in the Philippines. Acting as consultants to the committee are technical experts from the government and private sector. Key government ministries and agencies reportedly have been assigned to lead the automation project and will be the first to acquire equipment.

VIENNA — Philips Data GesmbH announced a microcomputer named Yes. Yes is equipped with an Intel Corp. 80186 processor, DOS-Plus operating system and 64K bytes of read-only memory from Digital Research, Inc. Production of the system will take place in Austria, Philips said. For marketing and sales within Austria, Philips said it hopes to line up 100 distribution partners before the end of 1985.

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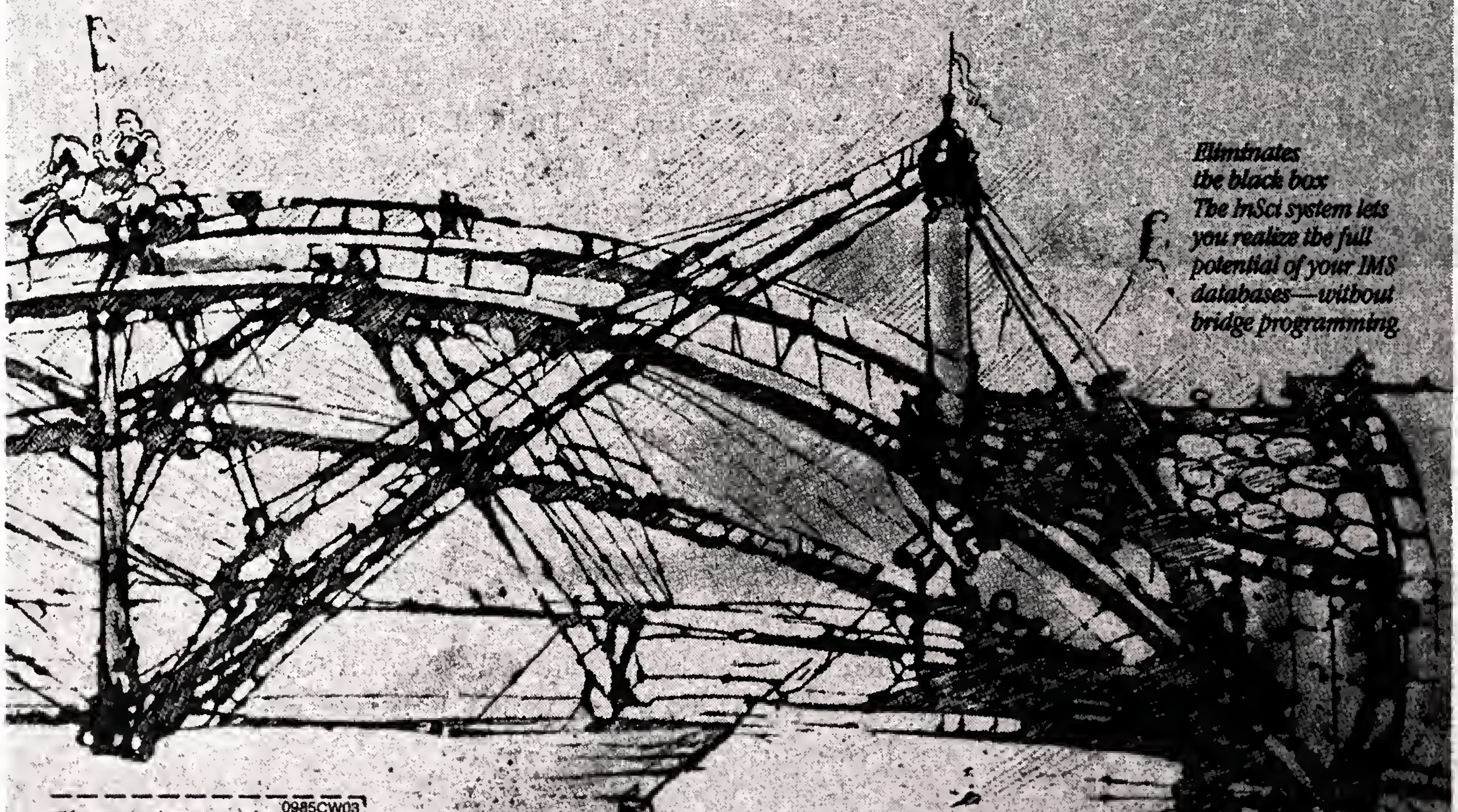

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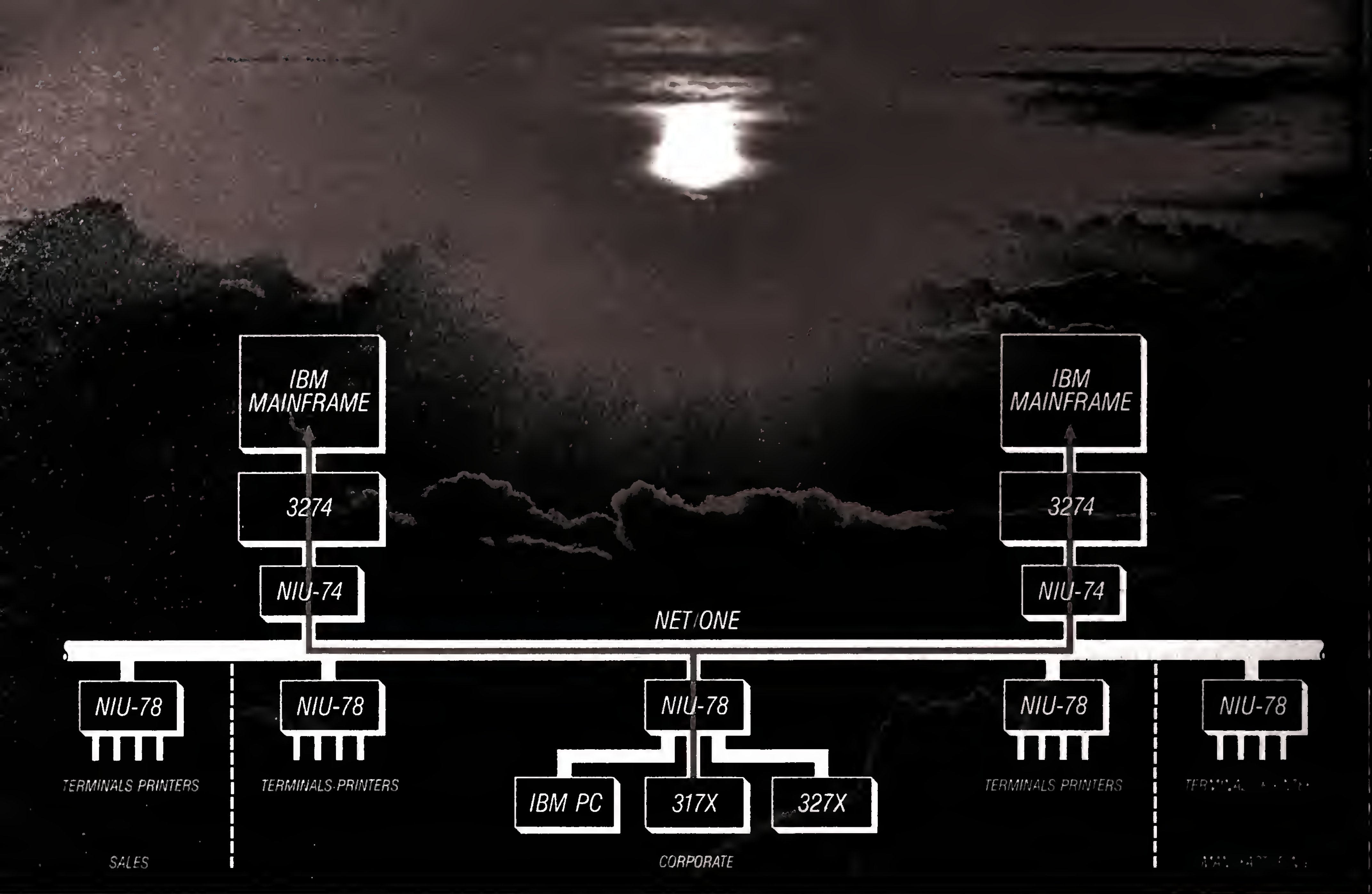

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Micro statistics tool helps General Foods track tastes

Cuts division's $6,000 monthly CPU costs

WHITE PLAINS, N.Y. — You can't tell a book by its cover, and you can't judge a cereal by the design of its box. Nevertheless, said a spokesman for General Foods Corp., maker of the Post brand breakfast cereals, research shows that such factors as package shape or color can translate into millions of dollars of sales — lost or gained — for the company.

So it was with appropriate thoroughness and care that the General Foods' food division headquarters in this New York suburb went about selecting a microcomputer statistical analysis package to help determine the likely affects of product packaging and other variables on consumers' buying decisions. The headquarters supports six food divisions, which make and market products such as Minute Rice, Maxwell House Coffee, Oscar Mayer bologna and Post Raisin Bran.

According to Stephen Rood, a group marketing information associate at General Foods, members of the company's data research department will survey hundreds — sometimes thousands — of consumers to gather information about their purchasing habits. General Foods researchers collect demographic data as well as information about test subjects' reactions to a product or a package design.

The data sets that contain information from the surveys are large, Rood said. "It would be typical to find someone looking at, say, 30 variables and 1,000 cases from the interview data."

Until recently, the market research group relied on mainframe software packages, mostly SAS Institute, Inc.'s SAS, to perform regression analyses and other statistical operations on the information that had been collected. To access the software, which runs on a 16M-byte IBM 3033 at General Foods' corporate headquarters in Rye Brook, N.Y., the group had to pay up to $6,000 per month for CPU time.

"What was happening," Rood continued, "was that a number of people were coming in and saying, 'Well, gee, if I could download the data to a micro, it could substantially cut those costs.' "

Last summer, Rood, who is responsible for finding tools for market analysts to use in their work, obtained a copy of SPSS, Inc.'s SPSS/PC and installed it on an IBM Personal Computer XT. Since then, he and seven other micro users have been performing statistical analyses on micros using the SPSS package.

To access survey data, users dial into either the 3033 or one of 10 Prime Computer, Inc. 2250s General Foods maintains for data storage. They download the information to SPSS/PC using error-checking communications protocols in Temple, Barker & Sloane, Inc.'s Addata data base software. Portions of Addata run both on the 3033 and on the personal computers that run SPSS/PC.

For operations that the micro package does not support, such as discriminate analyses, and for analysis of data sets with more variables than the micro package can handle, users still rely on mainframe software. Rood said applications involving both micro and mainframe analyses at different stages are common.

Since the micro software has been installed, however, analysts have used it for as many projects as possible, Rood said, because of the cost savings it represents.

Besides performing regression, variance and factor analysis procedures on market research data, the analysts use the software to examine consumer trends and warehouse figures on product turnover. They also use it to prepare data for procedures like graphics display that are available in other software packages.

Top line summary

Application: Microcomputer statistical analysis package

Business: Packaged food

User: General Foods Corp.

Rood said most analysts learned to use SPSS/PC within a week because they had been exposed to SPSS mainframe software at college and had no problem understanding the micro version's documentation. The short learning cycle translated into lower costs and higher efficiency.

"We need a situation where we're not going to have analysts spending a great deal of time learning a new program," he said. "This package lets them get into their analysis and use a variety of statistical procedures on their data right away and with relatively little help."

Rood said he expects about 100 employees at General Foods to use the micro statistical analysis software eventually. The firm does not impose any top-down restrictions on microcomputer hardware and software. Users who can justify a purchase to their superiors are free to buy whatever they think will meet their needs. The company maintains an information center to guide users in their choices.

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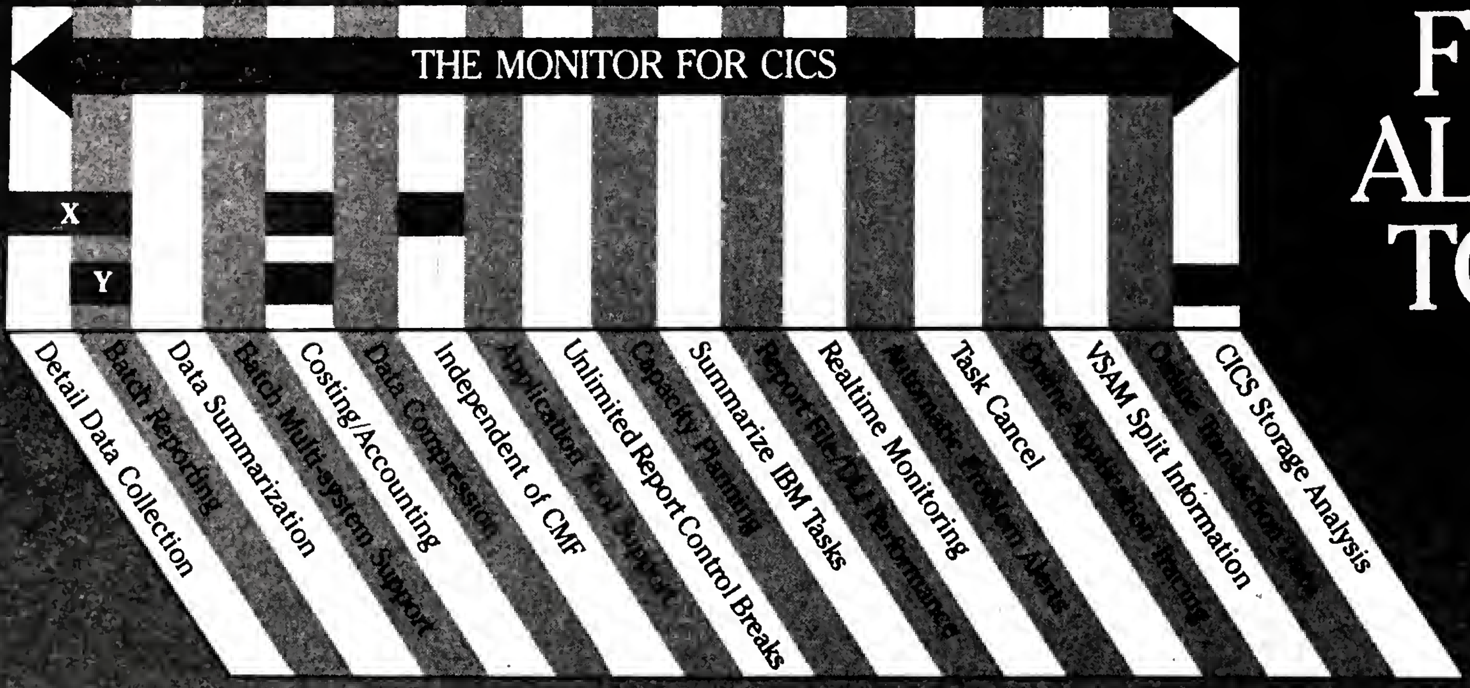

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CALENDAR

WEEK OF OCTOBER 20

OCTOBER 21-22, LOS ANGELES — **Direct Response Marketing for Financial Institutions: Telemarketing, Direct Mail & Sales Training.** Contact: Alice Gibons, Inter-Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925.

OCTOBER 21-23, BOSTON — **Hammer Forum '85: Shaping the Second Revolution in End-User Computing.** Contact: Hammer and Co., Hammer Forum, 5 Cambridge Center, Cambridge, Mass. 02142.

OCTOBER 21-23, SAN FRANCISCO — **Lamond on IBM.** Contact: Reggi Veatch, National Marketing, Suite E-1A, Standard Court E., 9160 Red Branch Road, Columbia, Md. 21045. Also being held Oct. 29-31 in Dallas and Nov. 4-6 in Boston.

OCTOBER 21-23, WASHINGTON, D.C. — **Controlling Software Projects: Management, Measurement and Estimation.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held Dec. 9-11 in Dallas.

OCTOBER 21-24, CHICAGO — **Systems & Applied Technology Conference & Exhibition (Satech '85).** Contact: Satech '85, 2472 Eastman Ave., No. 34, Ventura, Calif. 93003.

OCTOBER 21-24, PITTSBURGH — **Work Measurement Techniques Workshop Series.** Contact: Institute of Industrial Engineers, Registrar, 25 Technology Park/Atlanta, Norcross, Ga. 30092.

OCTOBER 21-25, BOSTON — **Analysis Workshop.** Contact: Judy Trelogan, Arthur Young & Co., 1950 Roland Clarke Place, Reston, Va. 22091.

OCTOBER 21-25, CHICAGO — **CICS Macro-Level Programming.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 21-25, NEW YORK — **Comprehensive Course in Data Communications.** Contact: *Data Communications*, Special Projects Conference Management Center, c/o Information-Breakthroughs, Inc., 445 W. Main St., Wyckoff, N.J. 07481. Also being held Nov. 18-22 in Lake Buena Vista, Fla.

OCTOBER 21-25, NEW YORK — **Structured Systems Design Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop West, Houston, Texas 77092.

OCTOBER 21-25, WASHINGTON, D.C. — **Ada Software Engineering Workshop.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held Oct. 28 to Nov. 1 in Los Angeles.

OCTOBER 22-23, BOSTON — **Developing End-of-Arm Tooling for Industrial Robots.** Contact: Robotics International of the Society of Manufacturing Engineers (SME), P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

OCTOBER 22-25, DENVER — **Data Base: A Builder's Guide.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also set for Nov. 12-15 in Dallas and Dec. 3-6 in Washington, D.C.

OCTOBER 22-25, SAN FRANCISCO — **Worldcom '85 — World Communications and Computers: 1985-2000 Conference and Exhibit.** Contact: International Council for Planning and Innovation, P.O. Box 17392, Washington, D.C. 20041.

OCTOBER 22-26, SAN FRANCISCO — **Fifth Multinational Conference on World Communications and Computers.** Contact: International Council for Planning, P.O. Box 17392, Washington, D.C. 20041.

OCTOBER 23-25, NEW YORK — **Strategies for Office Automation.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held March 11-13 in Boston.

OCTOBER 24, NEW YORK — **DOS/VSE for Systems Programmers.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 24-25, LOS ANGELES — **Local-Area Networks: Selection and Implementation.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

OCTOBER 24-25, SAN FRANCISCO — **Lamond — The IBM PC.** Contact: Reggi Veatch, National Marketing, Suite E-1A, Standard Court E., 9160 Red Branch Road, Columbia, Md. 21045. Also being held Nov. 7-8 in Boston.

OCTOBER 24-25, SAN FRANCISCO — **PC as a Programmer/Analyst Workstation.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810. Also being held Nov. 21-22 in Washington, D.C. and Dec. 12-13 in Boston.

OCTOBER 25-27, FRANKFURT — **The Forth Modification Laboratory Conference.** Contact: Forth Interest Group, P.O. Box 8231, San Jose, Calif. 95155.

WEEK OF OCTOBER 27

OCTOBER 26-27, HOUSTON — **Isecon '85: The Information Systems Education Conference.** Contact: Isecon '85, Data Processing Management Association, 505 Busse Highway, Park Ridge, Ill. 60068.

OCTOBER 27-30, CHICAGO — **International Facility Management Association 1985.** Contact: Melvin R. Schlitt, Executive Director, International Facility Management Association, Suite 1410, 11 Greenway Plaza, Houston, Texas 77046.

OCTOBER 28, ZURICH — **Europe's New Challenge: Emerging Business Opportunities Related to**

Continued on page 44

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—*ComputerWorld*

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Team Xerox

From page 41

Calendar

Gaas and the III-V Technologies. Contact: Robert F. Dick, Horizon Associates, 2255-G Martin Ave., Santa Clara, Calif. 95050.

OCTOBER 28-29, DALLAS — **The Computer Acquisition Forum.** Contact: Ashley Pearce, Gartner Group, Inc., P.O. Box 10212, Stamford, Conn. 06904.

OCTOBER 28-29, SAN FRANCISCO — **Payment Systems Partnerships II.** Contact: Alice Gibons, Inter-Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925.

OCTOBER 28-30, BOSTON — **X.25 and Other Protocols.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

OCTOBER 28-30, COLUMBUS, OHIO — **C Programming Language.** Contact: Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

OCTOBER 28-30, HOUSTON — **The 34th Annual Data Processing Management Exposition (DPMA) International Computer Conference and Business Exposition — DPMA Houston '85.** Contact: Doris Dodge, Conference Meetings Manager, DPMA International Headquarters, 505 Busse Highway, Park Ridge, Ill. 60068.

OCTOBER 28-30, NEW YORK — **Cellular Communications '85.** Contact: Online Conferences, Inc., 989 Avenue of the Americas, New York, N.Y. 10018.

OCTOBER 28-30, NEW YORK — **Localnet '85.** Contact: Online Conferences, Inc., 989 Avenue of the Americas, New York, N.Y. 10018.

OCTOBER 28-30, WASHINGTON, D.C. — **Local-Area Networks.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

OCTOBER 28-NOVEMBER 1, BOSTON — **CICS/VS Command-Level Programming Course.** Contact: Computer Assistance Product Development Corp., Suite 108, 11498 Luna Road, Dallas, Texas 75234.

OCTOBER 28-NOVEMBER 1, BOSTON — **Information Modeling Workshop.** Contact: Judy Trelogan, Arthur Young & Co., 1950 Roland Clarke Place, Reston, Va. 22091.

OCTOBER 28-NOVEMBER 1, NEW YORK — **Database Development Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop West, Houston, Texas 77092.

OCTOBER 28-NOVEMBER 1, TORONTO — **The James Martin Seminar.** Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402. Also being held Nov. 18-22 in Atlanta.

OCTOBER 29-31, WASHINGTON, D.C. — **The Sixth Annual Federal Office Automation Conference.** Contact: Dallas Kinney, Conference Communications, Box N, Wayland, Mass. 01778.

OCTOBER 31-NOVEMBER 1, SAN ANTONIO — **Federal ADP and Telecommunications Procurement.** Contact: International Data Corp., Washington Division, Suite 240, 1500 Planning Research Drive, McLean, Va. 22102. Also being held Nov. 14-15 in McLean.

WEEK OF NOVEMBER 3

NOVEMBER 4-5, BOULDER, COLO. — **International Tele/Conferencing Symposium.** Contact: Tom Cross, Cross Information Co., Suite C, 934 Pearl St., Boulder, Colo. 80302.

NOVEMBER 4-6, WASHINGTON, D.C. — **Data Dictionaries: Concepts, Contents and Uses.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

NOVEMBER 6-8, BELLEVUE, WASH. — **Hands-On Unix for Programmers.** Contact: Specialized Systems Consultants, P.O. Box 55549, Seattle, Wash. 98155.

NOVEMBER 7-8, NEW YORK — **Videotex Delivery of Financial Services: On-Line Banking, Electronic Brokerage and Transactional Services.** Contact: Alice Gibons, Inter-Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925. Also being held November 14-15 in San Francisco.

NOVEMBER 7-8, WASHINGTON, D.C. — **Data Administration: Development and Practice.** Contact: Barnett Data Systems, 19 Orchard Way N. Rockville, Md. 20854.

NOVEMBER 9, NEW YORK — **Computer Education in Transition, B.A.S.I.C.(s) and Beyond.** Contact: Association of Computer Educators, 751 Bard Ave., Staten Island, N.Y. 10310.

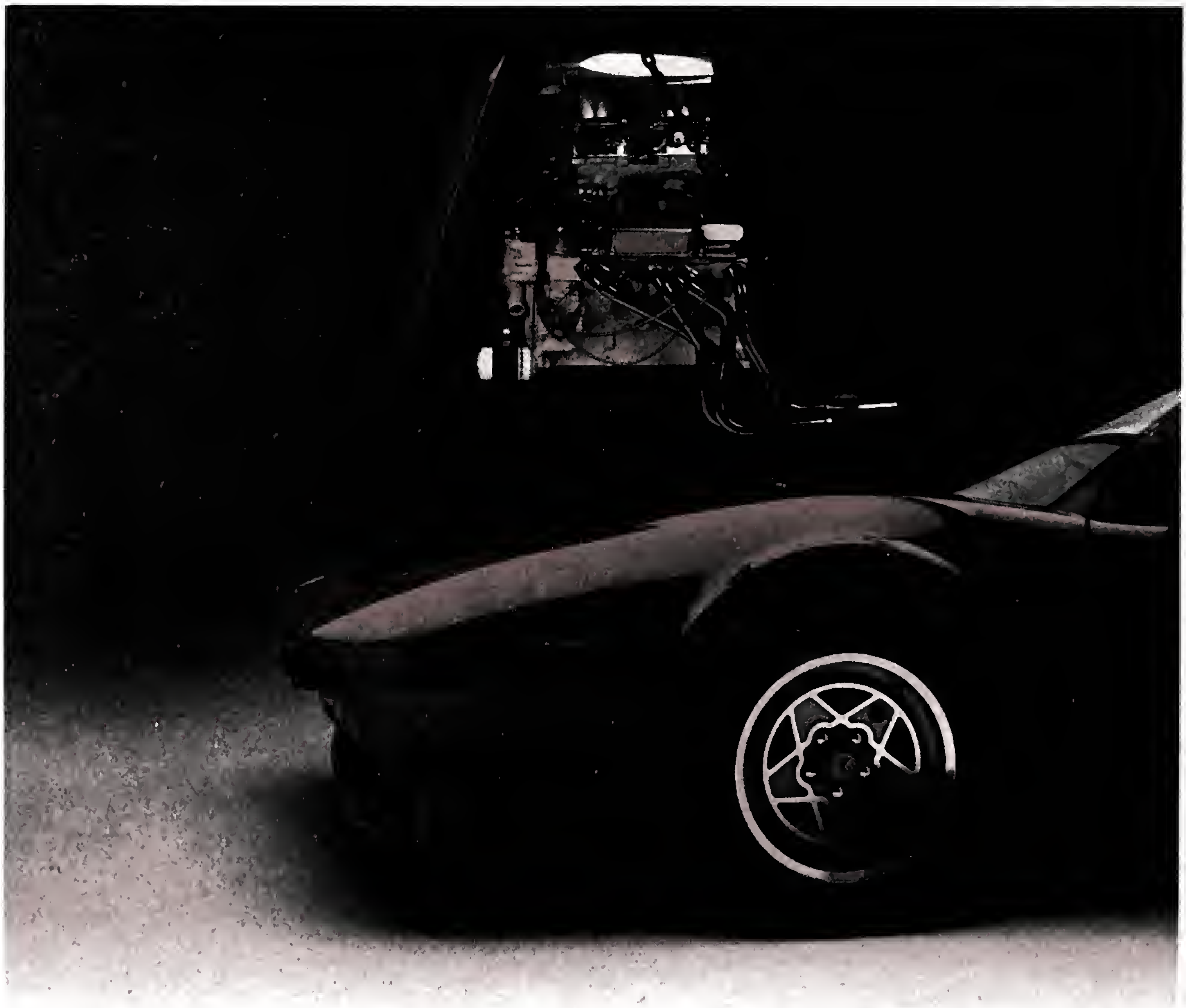
WEEK OF NOVEMBER 10

NOVEMBER 10-13, BALTIMORE — **The Ninth Annual Symposium on Computer Applications in Medical Care (SCAMC).** Contact: Gail Mutnik, Symposium Coordinator, SCAMC, Secretariat: Office of Continuing Medical Education, George Washington University Medical Center, 2300 K St. N.W., Washington, D.C. 20037.

NOVEMBER 11-13, WASHINGTON, D.C. — **The Conference on Software Maintenance-1985 (CSM-85).** Contact: Donald A. Parker, CSM-85 Publicity Chairman, National Aeronautics and Space Administration, Goddard Space Flight Center, Code 820.1, Greenbelt, Md. 20771.

NOVEMBER 11-15, SAN JOSE, CALIF. — **First International Conference on Computer Workstations.** Contact: Institute of Electrical and Electronics Engineers, Inc. Computer Society, 10662 Los Vaqueros Circle, Los Alamitos, Calif. 90720.

NOVEMBER 12, NEW YORK — **T-1 Carrier Strategies.** Contact: DMW Group, Inc., Seminar Division, 2020 Hogback Road, Ann Arbor, Mich. 48104.



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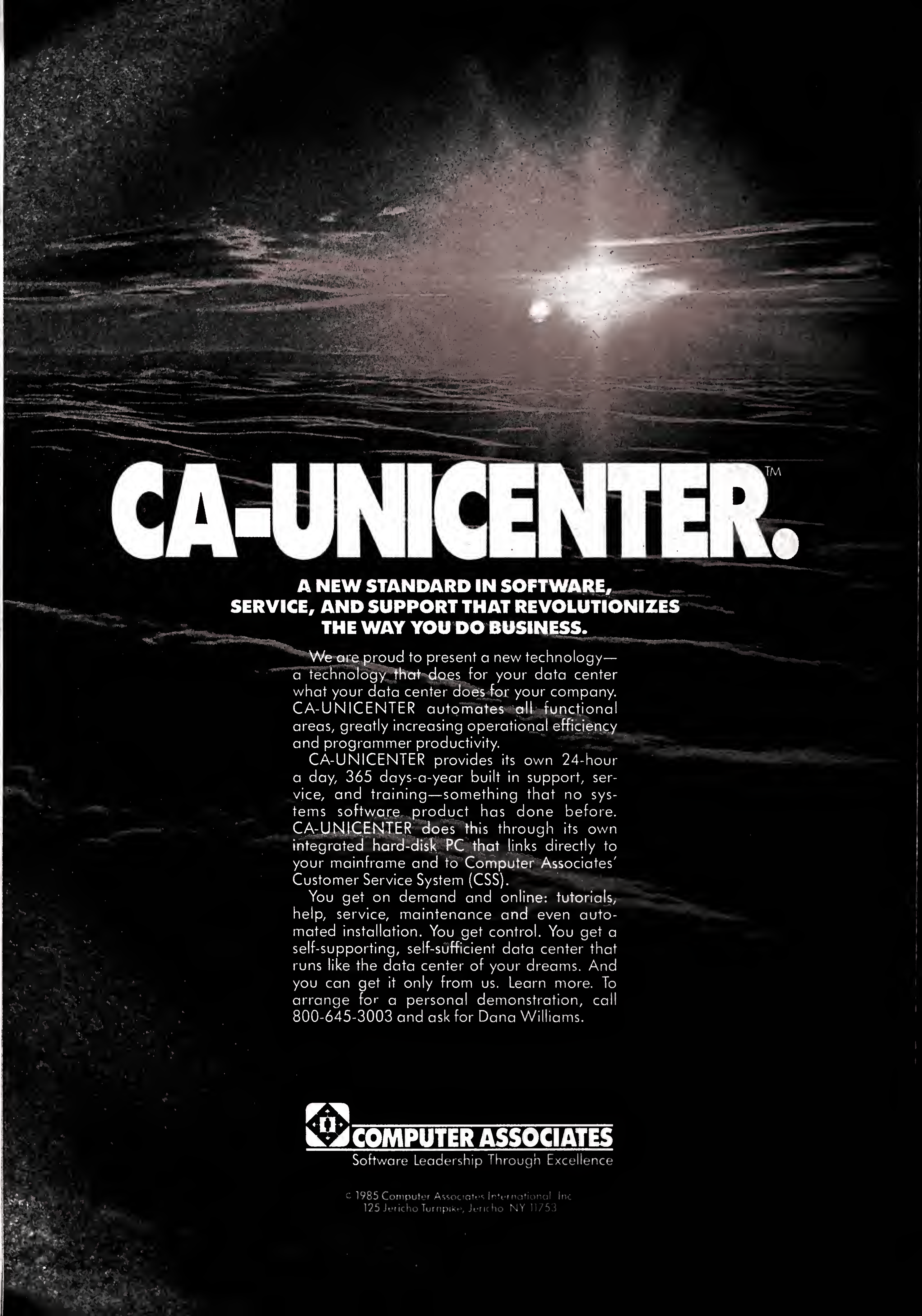

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SOFTWARE & SERVICES

UK users moving to MVS

Security called catalyst for migration from DOS

By John Desmond

BUCKINGHAM, England — DP auditors in the UK who are demanding improved data access security are helping to drive conversions from IBM's widely installed DOS/VSE to its strategic MVS operating system.

That is according to Michael Kerford-Byrnes, principal of MKB Technical Services, a consulting firm that specializes in DOS-to-MVS conversions.

"Here, internal and external auditors who come to computer installations actually have some teeth, and because they have a bit of computer knowledge, they know where to bite," Kerford-Byrnes said in a telephone interview from England.

"A lot of users are running out of steam with DOS' and they need [Extended Architecture (XA)]. They need it for capacity, for function, and they desperately need it for security," he continued. "The general attitude over here is rapidly becoming if you're going to have any sort of access control, it's got to be RACF or something like it," he said, referring to IBM's Resource Access Control Facility MVS security control program.

Thus, he said, more and more users in Europe are being attracted to MVS for a reason other than the need for increased functionality and capacity. Rather, the demand for better data security is becoming a chief motivation to convert.

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SOFTSCOPE

Notes from the software industry front

Sunnyvale, Calif.-based **Data Design Associates, Inc.** and **Applied Data Research, Inc.** (ADR) of Princeton, N.J., announced a development and marketing agreement through which Data Design's four mainframe financial applications will work with ADR's Datacom/DB relational data base management system. Data Design's accounts payable, general ledger, fixed assets and capital project management tools will be compatible with Datacom/DB.

■

Mitrol, Inc. of Woburn, Mass., has purchased worldwide exclusive distribution, marketing and maintenance rights to Rockville, Md.-based **General Electric Information Services Co.'s** (Geisco) Mims manufacturing applications development system. Mitrol said it will market Mims in North and South America. Through Geisco's partnership with **Teamco** of Norway, Teamco will

Continued on page 51

DOS micros get IBM link

Multi Soft, Inc. of Edison, N.J., has announced Super-Link, a micro-mainframe link package for data transfer between IBM's PC-DOS or Microsoft Corp.'s MS-DOS operating systems and IBM mainframes.

Super-Link includes a microcomputer control program, a library of mainframe subroutines and a microcomputer screen management program.

Super-Link will support IBM mainframes running VM/CMS, TSO or CICS and micros running PC-DOS, MS-DOS and S1, a microcomputer operating system developed by Multi Solutions, Inc., parent company of Multi Soft. S1 is available for several Motorola, Inc. 68010 microprocessor-based micros.

The micro-mainframe product provides links to applications running on the mainframe, rather than direct links into data base management systems. The VM/CMS version is available now, and the CICS and TSO versions are scheduled to be available by the end of October. Super-Link is priced from $10,000 to $50,000 depending on the hardware and number of micros.

SOFTALK
John Gallant
CW Senior Editor

Cobol 85 plods to acceptance

There's a good chance the beleaguered Cobol 85 standard will finally cross both the international and American finish lines before the end of this year.

But don't be overly surprised if the standardization process stretches into the new year and what could have been Cobol 85 becomes instead Cobol 86. The controversial — to say the least — Cobol 85 standard has exhibited a real knack for discovering stumbling blocks as it plods along toward International Standards Organization (ISO) and American National Standards Institute (Ansi) approval. Whether the proposed standard will find yet another such obstacle before January is anybody's guess.

The proposed Cobol standard was known for years as Cobol 80 and was initially envisioned as a routine overhaul of the existing Cobol 74 standard. But Cobol 80 was just not to be. Cobol 85's official label, 8X, replaced the 80 as a sign of just how uncertain the final date of approval would be. If the standard does indeed become known as Cobol 85, it will represent the first internationally embraced upgrade of the most widely used programming language in 11 years. That's simply too long.

Though a programming language like Cobol may seem dry and uninteresting to the uninitiated, it is a language that, like any other, must evolve over time if it is to survive. As with English, programming languages have to change to accommodate new ideas and new approaches.

Changes to spoken languages are subtle and reflect shifts in attitudes

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■ Major licensees of Pick Systems' Pick operating system have banded together to draft applications portability standards/**48**

■ Control Data introduced a service designed to help its Cyber 180 users manage their DP resources/**48**

■ Whitesmiths made its Idris operating system available for Hewlett-Packard's Series 200 technical workstations/**48**

■ Interactive Software Systems unveiled Panelpro, an IBM CICS applications development tool/**49**

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Harris Corp. has introduced Harris Civilcad software with design, drafting and data management capabilities for civil engineering and construction applications.

The software runs on all H series superminicomputers from the Fort Lauderdale, Fla.-based company. Civilcad includes seven modules: Digital Terrain Modeling, Cogo, Hydro, Bill of Materials, Earthwork, Roadway Profile Design System and Civilcad Drafting.

Each module can be purchased separately or in combination. On the entry-level Harris 60, up to 48 users can work with the Civilcad software modules for concurrent handling of various tasks. Harris processors can host Harris microcomputers or any IBM-compatible microcomputers as workstations or terminals.

A turnkey Civilcad system with hardware, software and peripheral equipment for a four-user civil engineering environment costs $194,000.

The system includes a Harris 60 superminicomputer, a 474M-byte disk drive, a streaming tape drive, a floating-point processor, a matrix printer, four graphics terminals, four digitizing tablets, a plotter and Harris Drafting, Cogo and Digital Terrain Modeling software modules.

The price for all seven modules in the Civilcad package is $56,000. The packages are available now.

Pick users to set guides

LAS VEGAS (CWN) — Major licensees of the Pick operating system have formed an association that will seek to establish basic standards designed to allow portability of users' applications under the numerous implementations of the operating system.

Representatives of 11 of the operating system licensees formed the association under the temporary chairmanship of Leonard Mackenzie, chief executive officer of General Automation, Inc., Anaheim, Calif. General Automation uses Pick as the operating environment for its GA Zebra series of supermicrocomputers.

Two interim committees were also formed, a technical standards committee and a committee that will meet in October to formalize the association, elect officers and define its charter.

Dick Pick, the developer of the operating system, has also been invited to join the association through his company, Pick Systems, Inc. of Irvine, Calif.

CDC provides consulting service

Control Data Corp., based in Minneapolis, has announced a consulting service to help Cyber 180 series computer users running the NOS or NOS/VE operating systems manage present and future computer resources.

The Capacity Management and Performance Analysis Service consists of two component services, Vital Signs and Work Load Analysis.

The Vital Signs service provides software said to monitor and analyze system use, establish a base line, recommend system tuning alternatives and monitor system performance.

In addition, a report prepared every quarter provides a summary of resource usage, system dynamics, system overhead and resource overlap and recommends ways to improve system performance and throughput, a spokesman said.

The Work Load Analysis service predicts future work load levels and generates configuration alternatives to process the predicted work load, which is based on customer forecasts of applications growth, according to the vendor.

Prices range between $14,000 and $22,000 per year for Vital Signs; Work Load Analysis costs between $14,000 and $20,000 per year, CDC said.

Operating system out for HP Series 200

Whitesmiths, Ltd. of Concord, Mass., has announced that its Idris operating system is now available for Hewlett-Packard Co.'s Series 200 technical workstations running on the HP 9000 minicomputer.

Idris is a real-time, multiuser, multitasking operating system created by Whitesmiths for software development. Idris was designed to run on small machines, such as the HP Series 200. The operating system is said to provide a real-time environment compatible with AT&T's Unix.

The product is managed by a hybrid schedule, which allows for both deterministic execution of real-time processes and reasonable response time for interactive time-sharing processes in a time-sharing system. Idris provides low-level file and device I/O services and interprocess communications using shared data, locks, events and messages as well as Unix-style "pipelines."

Device drivers are included in C source for floppy disk drives, hard disks, printers, serial I/O, terminals and integral CRTs and keyboards. Approximately 100 utilities are provided with Idris, including Whitesmiths' C and Pascal compilers as well as an assembler, linker, librarian and related object tools.

A variety of software tools for such functions as communicating with other systems, controlling multiuser login and security and sending and receiving mail are also included.

The single-unit price for Idris running on the HP Series 200 is $2,500.

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Panelpro boosts on-line applications development

Interactive Software Systems, Inc. of Chicago has announced Panelpro, a programming aid that allows Cobol programmers to develop on-line applications without knowledge of IBM's CICS.

Panelpro requires a programmer to know only Cobol to develop command-level programs, a spokesman said. Panelpro uses statements familiar to Cobol programmers such as Read/Write and Rewrite, which are said to reduce the need for CICS specialists.

Panelpro introduces the Procedure, Screen and Report verbs. Screens are painted by preparing subsequent screen lines, which range from one to 99,999 in number. Pseudo-conversational programming starts with the procedure code, circumventing conventional commentary normally required in Cobol.

In other features, Panelpro offers forward and backward paging, creation of temporary data names during coding and automatic editing.

Panelpro works with IBM Vsam file structures, eliminating the need to convert existing files when the system is installed. Panelpro is priced at $15,000.

Software said to translate PDP-11 programs to VAX

Virtual Systems, Inc. of Walnut Creek, Calif., has announced a program, Macrovax, that translates assembly language software written for Digital Equipment Corp. PDP-11 systems into VAX assembly language.

Originally written to translate the company's own library of PDP-11 source programs into VAX native-mode assembly language, Macrovax is now commercially available, according to the vendor.

Running on either the PDP-11 or VAX system, Macrovax can translate 98% of the PDP-11 assembly language programs with minimum programmer effort, a spokesman said. Assembly language directions and control statements are translated in such a way as to ensure optimum performance on a VAX.

Macrovax automatically segregates PDP-11 programs into code and data areas, and models the PDP-11 stack in the data area. Programs may be of any size, but data is limited to a 64K-byte area.

The Macrovax program is priced at $10,000 per CPU. The system includes manuals and a one-week training session.

SCA introduces source-to-load tracking option

Software Corporation of America (SCA) has announced the Connection option for its Change Tracker mainframe software, which automatically tracks changes made to executable libraries. The product runs in IBM OS, MVS and MVS/XA environments.

A spokesman for the Herndon, Va.-based SCA said the Connection option provides source-to-load change tracking capabilities. The option captures and records information about source modules as it is extracted and input to the compiler.

The information is carried forward through the compilation into the linked-edited load module. Used together, the Change Tracker and Connection options are said to eliminate manual efforts required to identify the source modules that comprise a load module.

The Change Tracker is integrated with the linkage editor and records each time a program is added or changed.

The Change Tracker is priced at $6,500 for a single-CPU permanent license and $9,900 for a site license. The Connection option, to be available in November, is priced at $3,500 for a single-CPU permanent license and $5,000 for a site license.

MProlog out for Lisp system

Logicware, Inc. of Toronto, Ontario, has announced that its MProlog language is available for the Symbolics, Inc. 3600 Lisp-based computer.

Previously available on a variety of machines, MProlog reportedly now allows artificial intelligence applications written in Prolog to run under Lisp.

According to the vendor, MProlog allows users to develop programs on a Lisp Symbolics 3600 machine and move those programs to a Motorola, Inc. MC 68000-based system. MProlog on the Symbolics 3600 costs $12,000.

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■ **Key Solutions, Inc. has announced Version 1.2 of the Missing Commands data inquiry and maintenance package, offering display or update of any IBM System/38 file in hexagonal, character or formatted mode.**

According to a spokesman, the Missing Commands package can be used to display and update any System/38 file one record at a time or one full page at a time.

In other added features, Missing Commands has an additional screen to display a full page of records, showing only the data from fields specified by the user, and a feature to scan optionally by field name. The product also has a new facility for deleting records and a display to provide current file information.

The Missing Commands is priced at $500. Current users can update to Version 1.2 for $75 per copy.

Key Solutions, 111-G Shelley Ave., Campbell, Calif. 95008.

■ **Adaroc, Inc. has announced the Project Implementation and Control System (Pics) for the IBM System/38.**

Pics is designed to monitor programs that are frequently updated and altered. The system supports multiple libraries and a variety of object management functions and ensures that production source and objects are synchronized and have been properly secured. It also ensures that new or changed objects have been successfully transferred to production, the vendor said.

Written in IBM's RPG-III, Pics is menu-driven and includes a management checkpoint feature that validates documentation and test requirements prior to job implementation.

Pics is priced at $1,850.

Adaroc, 30 Mohawk Drive, Northboro, Mass. 01532.

APPLICATION PACKAGES

■ **Prescience, Inc. has announced Hieroglyph, a report writing package for Sun Microsystems, Inc. workstations running AT&T's Unix.**

Hieroglyph integrates text processing, graphics, document aids, document filing, data handling and production tools, a spokesman said.

The software offers concurrent application processing, multiple window editing, computer-aided design graphics capabilities, the ability to embed graphics in text, the ability to scale graphics, support of laser printers, a spelling checker and three user-experience levels.

Hieroglyph sells for $2,400.

Prescience, Suite 300, 820 Bay Ave., Capitola, Calif. 95010.

LANGUAGES

■ **Pyramid Technology Corp. has announced optimizing Fortran 77, C and Pascal compilers for its Pyramid 90X, 90MX, 98X and 98XE processors.**

The compilers work with Pyramid's Common Language Environment, a standardized high-level program development and execution environment integrated with Pyramid's OSX operating system. The operating system is said to incorporate both the University of California at Berkeley's Unix 4.2 and AT&T's System V Unix features.

The C optimizing compiler will be bundled and shipped with OSX. Pyramid's optimizing Pascal and Fortran 77 compilers are priced at $6,000.

Pyramid Technology, 1295 Charleston Road, Mountain View, Calif. 94043.

■ **Touch Technologies, Inc. has announced that its data base language Intouch can now call routines written in other Digital Equipment Corp. VMS languages.**

Cobol, Fortran, C or Basic procedures can be executed from Intouch, a spokesman said. No compiling or linking is necessary.

Intouch is priced at $7,500 for the DEC VAX-11/730 and Microvax II, at $15,000 for the VAX-11/750, $25,000 for the VAX-11/780 and 785 and $40,000 for the VAX 8600.

Touch Technologies, Suite 101, 609 S. Escondido Blvd., Escondido, Calif. 92025.

■ **Franz, Inc. has released Opus 42, a version of its Franz Lisp interpreter and compiler that is said to provide compatibility with Common Lisp and object-oriented programming capabilities.**

A feature known as Flavors has been added to the Lisp kernel to give object-oriented programming capability, the vendor said. Other enhancements include the ability of functions to return multiple values, a package feature that allows multiple name spaces to reside in the Lisp environment, hash table objects, closures to control the scope of a variable definition and a history mechanism.

Opus 42 costs $5,000 for the first copy and $1,000 for subsequent copies. The new version is available on processors from Apollo Computer, Inc.; Sun Microsystems, Inc.; Cadmus Computer Systems, Inc.; Masscomp; Tektronix, Inc.; Harris Corp.; and Digital Equipment Corp.

Franz, 1141 Harbor Bay Pkwy., Alameda, Calif. 94501.

■ **A C compiler optimized for the Motorola, Inc. 68020 microprocessor is available from Alcyon Corp.**

The C6820 compiler will run under

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the following systems: Versados on most Motorola development systems; AT&T's Unix; Digital Equipment Corp. VAX VMS or Microvax computers; and Regulus on Alcyon processors, a spokesman said. An upgrade of Alcyon's C68 compiler, the C6820 contains the instructions and addressing modes of the MC68020 32-bit microprocessor and the MC68881 floating-point processor.

The C6820 is said to be a full implementation of the Kernighan and Ritchie C language specification and consists of a macro processor, compiler, relocatable assembler, linking loader, support library and utilities.

Support utilities download executable programs and symbol tables to the MC680X0 target via a serial channel.

Prices are $2,295 for Motorola hosts, $2,995 for VAX Unix systems and $3,495 for VAX VMS computers.

Alcyon, 8716 Production Ave., San Diego, Calif. 92121.

ON-LINE DATA BASES

■ **Zandar Data Corp. is offering the Surplus Electronics Component Acquisition Program data base of excess electronic and computer components that manufacturers want to sell.**

The seller pays $10 per item listed on the system, plus a 5% commission when the material is sold. The purchaser pays the seller directly, a spokesman said. Users order items through the system; the owner of the material makes the delivery, according to the spokesman.

Accessing the data base requires a terminal or computer operating at 300 bit/sec. Menus direct users to the desired categories where a catalog of available items is displayed.

Zandar Data, 2923 Osmundsen Road, Madison, Wis. 53711.

TRAINING

■ **Pansophic Systems, Inc. has announced that videos and workbooks are now available to aid users of Easytrieve Plus, the company's information retrieval and data management system.**

The basic video course offers instruction on computers and storage and on how to create an Easytrieve Plus program. The intermediate course covers 10 topics, such as writing Easytrieve Plus procedures and job activity tables.

The videos are free to Easytrieve customers with maintenance agreements. For new customers, the Easytrieve Plus videos cost $2,000 each or $3,000 for the two-video set.

Pansophic, 709 Enterprise Drive, Oak Brook, Ill. 60521.

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Notes from the software industry front

distribute Mims in Europe, the Far East and Africa.

■

Relational Technology, Inc., Alameda, Calif., said its Ingres relational data base management system was selected by **MIT** as the foundation data management system for the Cambridge, Mass.-based university's Project Athena. Project Athena is an Institutewide project to integrate computer and communications capabilities into all phases of the educational process.

■

Sequent Computer Systems of Beaverton, Ore., and **Unify Corp.** of Lake Oswego, Ore., have signed a marketing and distribution agreement that allows Sequent to market and support the Unify relational data base management system as part of its Balance 8000 parallel computing system. Unify was designed for AT&T Unix programming environments.

■

Cambridge, Mass.-based **BBN Software Products Corp.** and **Digital Equipment Corp.** of Maynard, Mass., inked a multiyear contract that allows DEC to manufacture, sell and support on a nonexclusive worldwide basis BBN Software Products' RS/1 engineering and scientific data analysis software. DEC previously sold RS/1 only in the U.S., Canada and Japan and did not provide technical support.

■

Tandem Computers, Inc., Cupertino, Calif., and **American Manage-**

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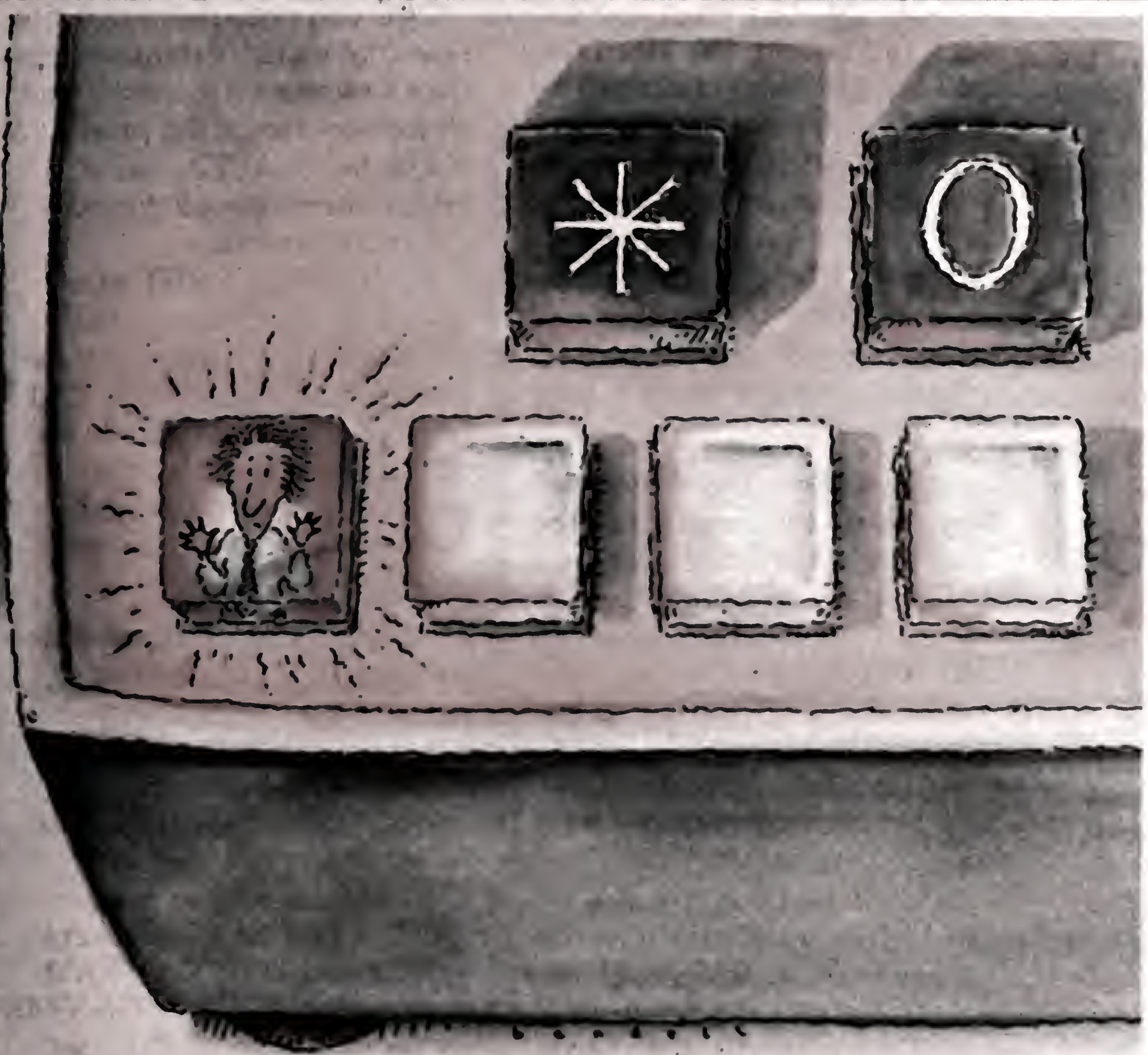

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Since ACF2 doesn't comfortably support phased implementation, your technical team has to remain on call to phase in every new stage of security.

Plus you need them to write essential security requirements (like a password history!) that should be part of the product.

The fact is ACF2 chains your systems people to security maintenance.

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Except for the hour or less it takes to install, TOP SECRET frees your systems people for other important jobs. You get easy maintenance without paying extra manpower premiums.

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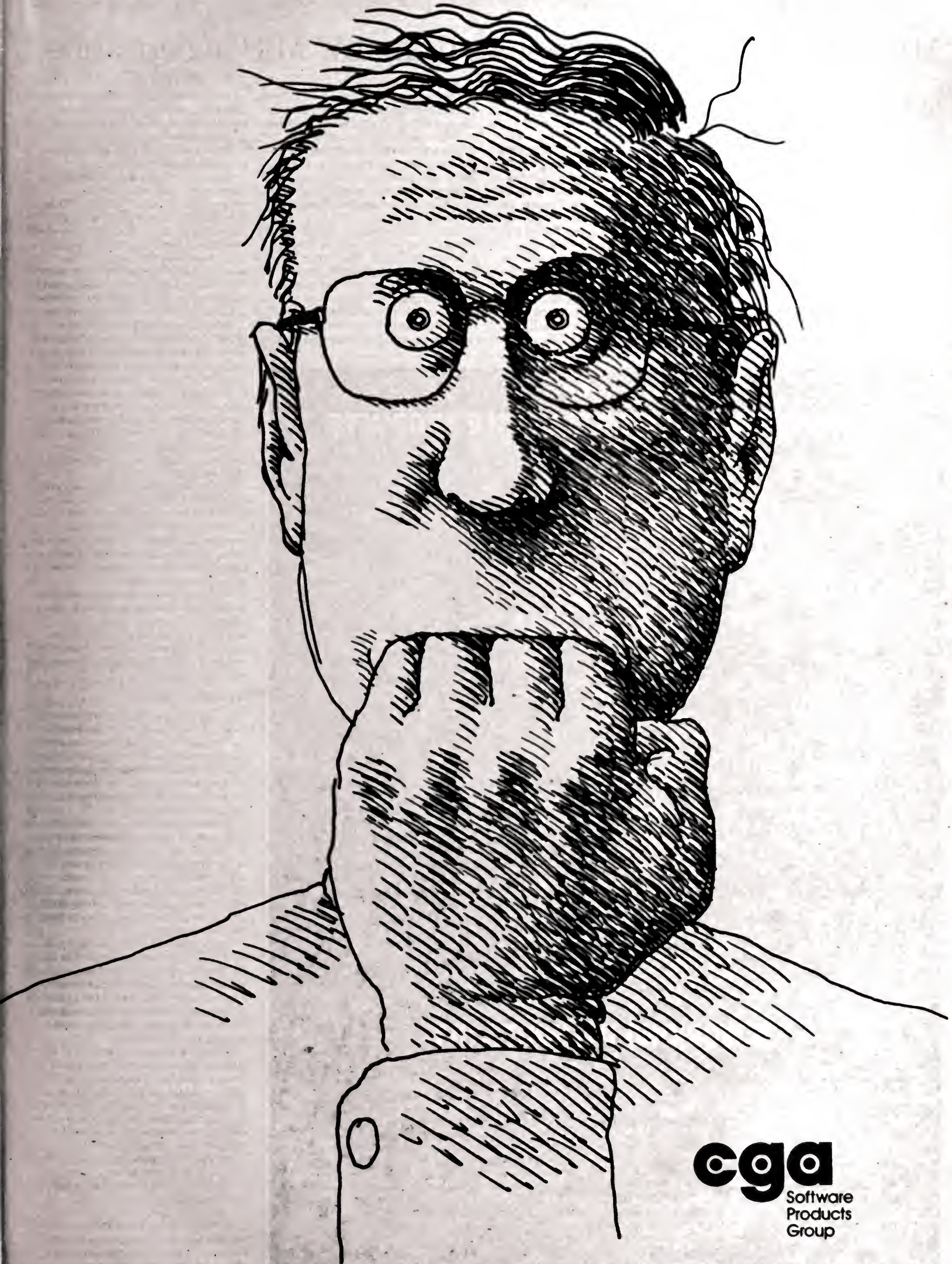

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Micro-mainframe concept striving for MIS acceptance

SOFTLINE
Thomas O'Flaherty

To paraphrase Mark Twain: Everyone talks about micro-mainframe links, but no one does anything about them. Or so it must seem to the dozens of link vendors that have seen their wares picked over but infrequently bought.

The frustrating thing is that so many people, both MIS professionals and end users, can see that micro-mainframe linkage would be the answer to many of their problems. A link cannot only get data to a user but also put the processing of that data into the end user's hands. More thoughtful MIS managers understand that pushing data and processing deeper into the organization will inevitably lead to cleaner data and more reliable processing.

Many observers have predicted a rapid increase in the use of micro-mainframe links. Instead, the growth in micro-mainframe applications has been relatively slow. But the term micro-mainframe link is already in danger of joining management information systems, distributed data processing, decision support systems and others that once promised to revolutionize data processing but instead were ignored or became objects of derision.

Actually, the micro-mainframe concept suffers the opposite problem from the fads listed above. Where they were heavy on concepts and light on practical choices, the micro-mainframe area presents a plethora of choices and, if anything, not enough conceptual glue to bind them together.

If, for example, micro-mainframe choices were limited only to data downloading, then, ironically, there would almost certainly be much more of it. The demand for data downloading is certainly high on most users' initial wish lists.

Downloading, if not too ambitious, can be accomplished relatively easily and can offer real benefits, reducing rekeying, combining data from different sources, ensuring better quality data and so on. There are many products available that can perform downloading reasonably well.

But even within downloading there are two issues that have slowed acceptance. The first is that the very number of products that can serve people's needs hinders and may even immobilize the decision process. In addition, selectors assume, usually incorrectly, that they are making a long-term decision with many implications, similar to choosing a data base management system.

Intertwined with the selection problem is that of overspecifying. As users begin to understand what they might want in a link, they begin to want more. Awkward, current-generation downloading is not enough for them. What they really want is the type of interactive downloading that would result from cruising through the mainframe data base and selecting/joining whatever data they need.

Obviously, such tools do not exist yet. Even if they did, the complexity of real-world mainframe DBMS, both from a technical and conceptual standpoint, would make the exercise far beyond the capabilities of most users, even those who fancy themselves computer literate.

MIS staff members sometimes contribute to the overspecifying by listening too closely to what users think they want — and users have become much more assertive as a result of real and imagined successes in using micros.

Typical MIS mistake

Ironically, the typical MIS error is to try to plan too far into the future. Authoritative checklists recommend such micro-mainframe capabilities as mainframe-type error checking and access security, multivendor environment compatibility and operational efficiency.

These capabilities are excellent. However, in most cases they are examples of the best being the enemy of the good. Far too little is known about the ultimate uses of micro-mainframe links to be able to say what the characteristics of any link should be within a particular organizational setting.

At the same time, one should not downplay the real problems that exist. Those organizations that have ventured beyond simple data downloading have begun to see that the real opportunities in the micro-mainframe environment are balanced by equally real problems.

What are the major problems? In strictly technical terms, users will not see seamless, distributed data base products for a very long time. Multiple data base management will be a painful experience where micro data bases are allowed to be both independent and meaningful.

As mentioned above, both data integrity and data security are in-

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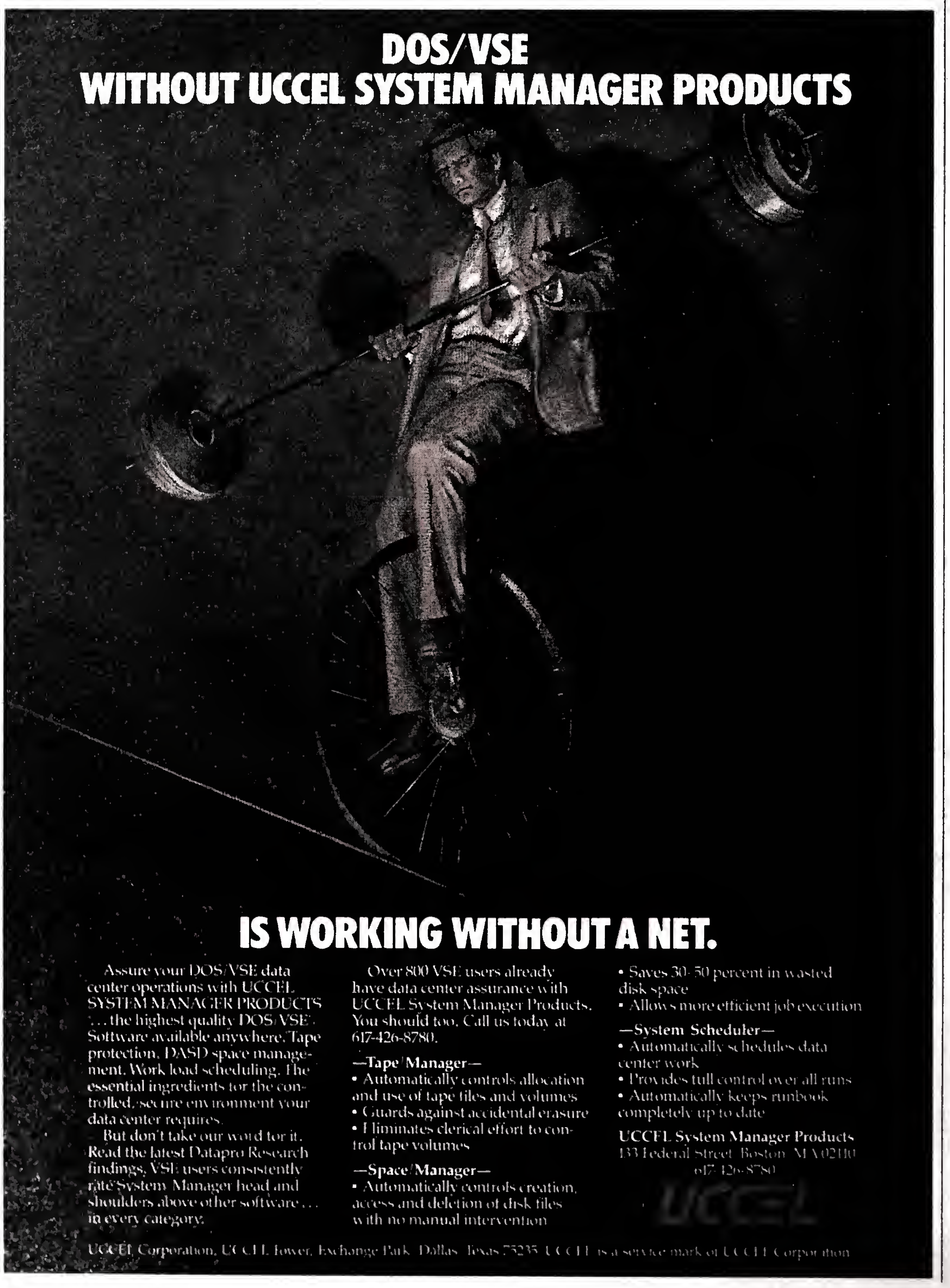
O'Flaherty is a principal of information service strategies in Wood-Ridge, N.J. He consults on MIS planning and the development of computer-based products.



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UK users converting from DOS/VSE to MVS

Nothing with the equivalent credibility of RACF exists in the DOS market, Kerford-Byrnes said. Also, few, if any, security products in the DOS market offer compatibility with MVS. "People aren't going to get hooked into a security system in the knowledge that they'll very likely have to abandon it when they go to MVS. So they decide to go straight to MVS."

Different auditors have different concerns. "Some don't like application programmers being able to change the little message on your credit card statement. Other companies don't like anybody being able to dial in, type in a password and get on-line to somebody's system. Others don't like the idea of source code even being read by anybody but the person who wrote it or the DP manager," according to Kerford-Byrnes.

Conversion outfits like MKB Technical Services are in demand because they have experience in DOS-to-MVS conversions, something few users can boast. "We've made nearly all the mistakes you can make. We know the things we must not do. In a DOS-to-MVS conversion, there is a list of things you must not do when setting up the MVS side of things. It's only once you've done those things you realize they're wrong. By that time, it's too late to go back," Kerford-Byrnes said.

For those shops that try conversion on their own, "It can stop application development work dead for anywhere up to a year," Kerford-Byrnes said. Even for those that hire a service, there are risks. "There is always going to be some sort of interruption of development work, because somebody's got to check it all out. Secondly, you have to provide education in the new technology."

Advance planning consumes one-third of an MKB conversion project's time. Planning encompasses subroutines, source code, sequence of job execution, an inventory of every program to be converted, setting of standards and procedures and a target completion date schedule.

Training users in an unfamiliar operating system is a major task of a good conversion service, Kerford-Byrnes maintained. "We provide education services to train the users in the standards and techniques we've derived for that shop," he said. "We teach them to be self-sufficient." In conjunction with the conversion team, the users write the JCL and procedures needed to operate the MVS system. The system is brought up live by the users under the guidance of the conversion team, the consultant said.

While applications and operations personnel in a DOS shop may know how to run the company payroll program blindfolded, they are not so confident with a new system. "If you take a turnkey conversion service and they get MVS up and running for you, and three weeks later you find you've got to rerun all three weeks work because there was a user data error, how do you do it? All you have is the working payroll system and the JCL to execute it. You've still got to learn how to run the converted system. And that is no small task."

The hardest part of the conversion process is taking applications that work in the DOS environment and making them work in the very different MVS environment. "You need to spend an awful lot of money converting something that works into something that works. Probably with a great deal of disruption, aggravation, hassles and bad feelings. With no immediate tangible benefit. That's a pitfall," Kerford-Byrnes said.

Despite the risks, the sooner users make the conversion the better, in Kerford-Byrnes' view. "The longer users leave it, the harder it will be, because they'll have more work to convert." Whether a user goes to MVS or directly to MVS/XA from DOS depends on the shop. "There's no point in spending all that money [for XA] if you don't need it," he said.

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Micro-mainframe links look for MIS acceptance

creasingly important issues when trying to combine the micro and mainframe worlds. Micros hooked to mainframes often do not observe even the most elementary rules of terminal security. The problem is, though, that micro-mainframe security must go beyond mere terminal security, if the micro-mainframe benefits are to be obtained. There are answers, but they are complex and not always complete.

The most critical technical problem is the one that is often not even perceived as an issue: How do you build micro-mainframe systems? Our slowly bought experience in designing and implementing traditional host systems has to be at least partially relearned in a micro-mainframe environment.

Basic questions have to be asked, including "How do you segment data? How do you segment processing? Who, or rather what, maintains control?"

Some mainframe-oriented design and implementation methodologies will not be able to be retrofitted at all. Others will need extensive changes in both concept and detail.

The micro-mainframe concept is real, but it will not overtake the world quickly, unlike the way that micros themselves did. Rather, the precedent is probably closer to that of DBMS, which took five to 10 years to become established even after there were viable products and concepts available.

Micro-mainframe experience can only be obtained the way that most experience is obtained, slowly and sometimes painfully.

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Cobol 85 plods along on its way to acceptance

and culture. But changes to a programming language must be adopted in a more formal fashion to ensure that they are consistently applied. That is especially true in Cobol's case because it is the premier business programming language and must mean one thing to all people if it is to have any value at all.

Thus it is ironic that the very process by which Cobol is upgraded and standardized is in danger of killing the language.

Perilously close to death

In the time since 26-year-old Cobol was born, the world of information processing has been completely reshaped. It is to the language's credit that it has survived this long. But during the period since 1978, when the Cobol 85 drafting process actually began, Cobol's image took a beating, and the language came perilously close to dying. Some said Cobol contracted an illness — obsolescence — from which it may never recover. Even an approved standard may not be medicine strong enough to save Cobol, they said.

Cobol has two things going for it of which the so-called fourth-generation languages, which have picked up so much ground in the last few years, cannot boast. One is the gargantuan inventory of existing Cobol programs, which provides an incentive for shops to stick with Cobol. The other is the fact that Cobol is an industry standard, and no fourth-generation language has emerged yet to take on that mantle.

But even the most zealous Cobol advocate would readily admit those qualities alone will do little to prolong Cobol's useful life. The only way it will survive is if new features and functions — that address the problems of productivity and maintenance — are added in a timely fashion. The drafters of Cobol 85 were well aware of that, and they took pains to implement a rich variety of features that make Cobol stronger.

However, many of the features embodied in Cobol 85 were envisioned years ago, and, had they been fully implemented in standard compilers, users could have enjoyed the benefits they offered much sooner. The overlong gap also prompted vendors to implement selected features of Cobol 85 in their compilers before the entire standard was approved. That posed a problem for users, eager to take advantage of the new features, who had to choose among different compilers, each offering selected pieces of Cobol 85.

The standards-making bodies have taken steps to refine the draft approval process, and credit should be given to those Ansi and ISO members who pushed for reform. Essentially, Cobol will now be given new features — addenda — every two or three years, and the language will be fully overhauled every decade.

It is imperative that the organizations make those reforms work. And it is important that the groups continue to implement new procedures for improving Cobol — and other widely used languages — in a swifter fashion. Age alone is no reason for Cobol to grow feeble and die. Those who rely on it must better address the task of ensuring its continuing health.

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Notes from the software industry front

ment Systems, Inc. (AMS) of Arlington, Va., will jointly market the AMS Computer Assisted Collection System to banks, financial houses and telecommunications companies as a result of an agreement penned recently by the two firms. AMS will license the software, which supports the collection of delinquent credit accounts, directly to Tandem Nonstop processor users as part of the Tandem Alliance.

■

In artificial intelligence happenings, **Inference Corp.**, Los Angeles, and **SRI International, Inc.** of Menlo Park, Calif., entered into an agreement through which Inference will train SRI knowledge engineers in the use of its Automated Reasoning Tool for expert systems development. SRI personnel will then provide consulting services for both Inference and SRI customers to aid in the building of expert systems.

■

Also in the AI world, **Teknowledge Federal Systems, Inc.** of Thousand Oaks, Calif., and **Computer Thought Corp.** of Plano, Texas, have indicated that negotiations are under way on a deal that would have Computer Thought convert Teknowledge's S.1 Version 2 knowledge system development tool to Ada. A Teknowledge representative said the conversion would allow the company's aerospace and defense customers to comply with the U.S. Department of Defense's Ada requirements.

■

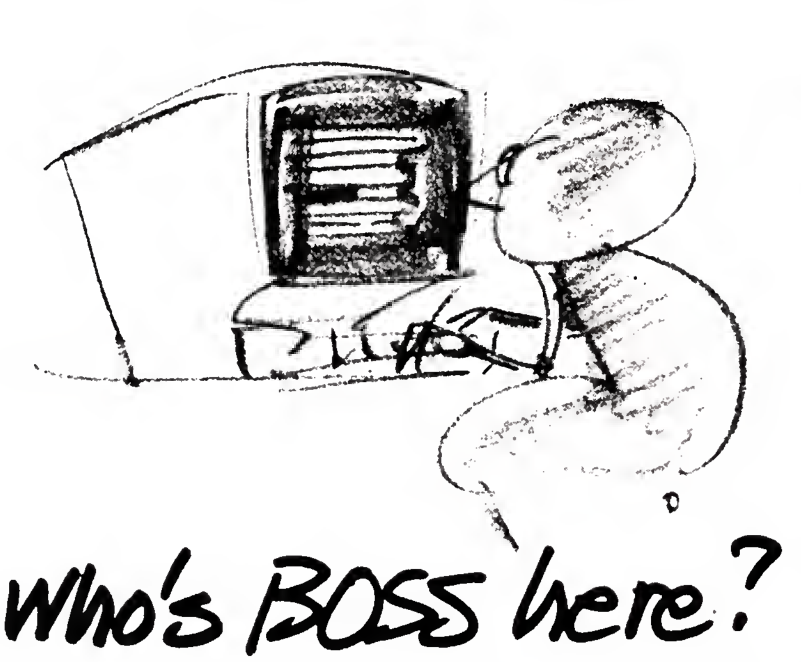
Palo Alto, Calif.-based **Quintus Computer Systems, Inc.**, developer of a Prolog compiler and other programming tools, unveiled agreements with **Digital Equipment Corp., Xerox Corp., C. Itoh Data Systems and Apollo Computer, Inc.** DEC will market, sell and distribute Quintus Prolog for its VAX systems; Quintus will deliver a version of the compiler for the Xerox 1100 series of artificial intelligence workstations; Apollo will jointly market the Prolog tool for its Domain workstations; and C. Itoh will distribute Quintus Prolog for the **Sun Microsystems, Inc.** Sun-2 workstation in Japan.

■

Primavera Systems, Inc., Bala Cynwyd, Pa., and **Control Data Corp.'s Cybernet Services Group** have entered into an agreement that makes Primavera's Project Planner and Primavision graphics software a key component in Control Data's new Cybernet Express Project Manager engineering project management software.

■

Quadratron Systems, Inc. of Sherman Oaks, Calif., will supply six of its software products for **Burroughs Corp.**, Detroit, B20/B25 and XE processors. The packages include Q-Office+, Q-File, Q-Plan, Q-Phact data base, Q-Chart and Q-Zed source code script editor. Burroughs will support the software with its version of AT&T Unix System V, which is scheduled to be released later this year.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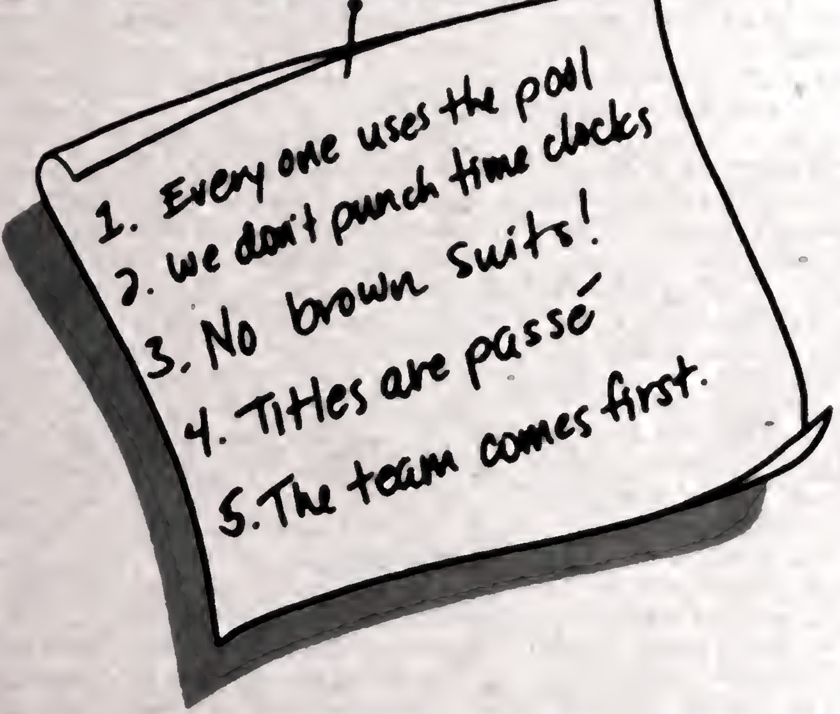
IN DEPTH

Harnessing Corporate Culture

By Jane Linder

The unwritten rules of corporate culture can confound the neophyte and the veteran alike. But once alerted, information systems professionals can put culture to work for them.



A large, successful manufacturing firm was known for its decentralized decision making. Autonomous operating units were structured as profit centers with full line and staff functions.

In this environment, the vice-president of manufacturing asked his information systems manager to begin installing common systems throughout the plants. The idea made sense to the manager. He began to staff projects and move toward installation. After 12 months of conflict, arguments and all-out confrontations, the manager conceded defeat and left the company.

One could blame his political skills for the debacle; the truth is that he ran afoul of the company culture. In this firm, the operating managers held clear, indelible authority for results and the means of achieving them. There was no value on cooperation; competition raged between groups.

The vice-president who suggested the changes had neglected to inform the powerful plant managers that they were to accept common systems. Instead, he asked the information systems manager to brave those waters on his own. Without visible support from the top, the manager had embarked on a countercultural effort to implement cooperation and some centralized decision making. From the outset, his chances for success were almost nil.

Corporate culture profoundly affects our ability to succeed. We can have a major influence on it.

Those who define culture speak of long-standing unwritten rules, matter-of-fact prejudices, customs for relating to colleagues or simply "the way we do things around here." Cultural anthropologists describe culture as a mechanism for adapting to the environment. In other words, culture is a set of behavioral prescriptions that help employees cope with the problems and decisions that face them daily.

These behavioral prescriptions represent, in codified form, the values of the company. Within a company, then, culture is an important mechanism for encouraging the "right" behavior — actions that uphold what the company stands for and help the company succeed on its own terms.

Culture influences both the systems we build and how we approach them. In addition, by building the "right" kinds of systems and using the "right" approaches, information systems can influence corporate culture.

Cultures vary tremendously, but five general dimensions describe common attributes of business culture (Figure 1, ID/2). These represent preferred behaviors: what is appropriate and "smart" behavior within the organization and what is not. Although these attributes are clearly simplifications of complex behavior patterns, they are useful for analysis.

Helping the company succeed

Let's assume that we are trying to support a stable, strategically valuable, existing culture. For each cultural dimension, we can identify the kinds of systems and information systems approaches that are culturally consistent.

There are three reasons why a culturally consistent approach is important:

- Well-defined cultures can help companies succeed. A strongly felt company culture encourages strategically correct behavior far more effectively than a network of control-oriented procedures. The culture's content — shared values, beliefs, implicit motivators — is a powerful, positive force in implementing company programs and guides behavior toward what is best for the firm. All things considered, it behooves information systems professionals to contribute to building a strong culture in whatever ways they can.
- On a more pragmatic level, information systems professionals succeed more often when they understand the company culture. Using culturally consistent systems and approaches is simply less risky. When the system fits the way business is conducted, end users feel comfortable and are

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Jane Linder is president of Linder & Associates, Inc. The Lexington, Mass., consulting firm works with senior MIS managers doing organizational planning.

satisfied customers. By carefully considering the firm's culture, MIS can make some predictions about what projects are most likely to succeed.

■ Very few of the tools for influencing culture are so easily engineered and implemented as information systems. Any information systems effort to influence culture should be part of the comprehensive, officially stated program.

Non-MIS tools such as compensation policy, hiring programs, supervisor training and management education are extremely influential to corporate culture. But their implementation is often longer term, so information systems can have a much more specific, much more immediate impact on behavior.

Spotting conservatives

So-called entrepreneurial firms encourage risk taking and are informal, aggressive, even impulsive. Above all, they value results. Conservative companies tend to be exactly the opposite. They are typically risk-averse, formal organizations with deliberate decision-making policies. The people in them adhere to procedures — they focus more on how something is done than on what is actually achieved.

Xerox Corp. used to be considered entrepreneurial but now might be seen as conservative. Most would agree that AT&T is trying to change from conservative to entrepreneurial. The stereotypical big company is conservative; the small one, entrepreneurial.

The entrepreneurial culture can be an exciting environment for information systems. Entrepreneurs are comfortable with state-of-the-art, unproven technologies. Their willingness to experiment can extend to challenging, high-payoff information systems projects.

Armed with a prototype approach, loose project definition and flexible tools, a staff of business analysts and technical wizards can match the action orientation that this culture values. Personnel should be dedicated to particular user areas to maximize service. In addition, a strong data administration function is vital to provide some glue between user-directed projects. (It need not, however, report through the information systems organization.)

The prototype methodology does not mean the entrepreneurial approach condones abandoning information systems planning. What is required is a top-down systems and telecommunications architecture — a rough blueprint for major data and processing blocks and the flows among them. Specific systems can be planned bottom-up with their respective users.

One problem that the MIS department faces in such a company is prudent resource management. One large entrepreneurial firm counted 1,100 MIS professionals in its ranks, compared with 250 in a conservative company with the same sales volume. Also, because of the interest in new technology, maintenance programmers and operations personnel tend to be accorded even less stature than usual.

A final difficulty for information systems in an entrepreneurial firm is enabling sufficient data access. The type of ad hoc systems that this culture tends to foster are normally data intensive. Add the fact that they are in constant flux and that information systems have great difficulty providing certified, available data.

In a conservative culture, on the other hand, proceduralized systems and proven technologies are preferable. Systems should be developed through a traditional life-cycle methodology using Cobol for efficiency.

The premier planning dimension in conservative companies is financial. Projects are selected based on tangible savings and return on investment, consistent with an overall spending guideline. All project and recurring expenses are charged back to the user to complete the picture of financial accountability. A monthly user steering committee sets priorities and monitors resource allocation.

Information systems development personnel in a conservative firm should be organizationally pooled for maximum productivity. Some may argue about whether pooling achieves greater productivity, but the important point from a cultural perspective is that business conservatives perceive that it does.

Maintenance personnel, on the other hand, should be dedicated to particular systems for operating stability. Strong, solid technicians should dominate the staff. The business savvy needed by individuals in the entrepreneurial setting is unnecessary here — the requirements are understood, and the pace of change is slow. Data center and telecommunications operations must be superb. These should be managed as factories using all the efficiencies made possible by a known environment.

Lines of authority

MIS issues in this culture include enforcing technology followership. The upshot may be a chronic exodus of the most capable people to more exciting shops. Occasionally, a "soft" benefit project will be important for the company. MIS personnel must find ways to identify these and sell them to top management.

In one conservative bank, analysts simply "jury-rigged" the cost/benefit projections to favor a telecommunications project. Senior management, comfortable with the financial analysis, approved a project that turned out to be unexpectedly important for the bank's competitive position.

Companies with clear lines of authority place decision making in the hands of a specific person. They align authority with responsibility and reward people for "stopping the buck."

Opposite these companies stand firms with ambiguous authority, firms that need to build support for ideas and action plans before they proceed. They lean toward matrix management structures where authority and responsibility are often shared or out of balance.

In many cases, an ambiguous authority structure is a veneer over highly centralized decision making. The military is an example of an organization with clear lines of authority. Texas Instruments, Inc.'s pre-1983 matrix management structure — since changed — institutionalized ambiguity.

When lines of authority are clearly drawn, information technology can be developed accordingly. Departmental functions can be automated under departmental aegis; the divisional data center can handle divisional decisions. Almost the only technology that cannot be distributed easily is corporate telecommunications.

The distributed architecture of hardware and software leads also to a hierarchy of data access in these firms. Each level of management receives the data needed to make the decisions for which it is responsible. Planning must be bottom-up, and MIS can play an important consulting role to ensure a coherent finished plan. Business unit managers should be allocated specific personnel and have ultimate responsibility for project progress and spending.

Dimensions of culture

Entrepreneurial	**Conservative**
Risk-encouraging Informal Decisive Results-oriented Aggressive	Risk-averse Formal Deliberate Process-oriented Defensive
Clear Lines of Authority	**Ambiguous Authority**
Functional or divisional Profit and loss responsibility Hierarchical	Matrix Cost and revenue centers Consensual
Cooperative	**Competitive**
Team-oriented Collaborative Reward-oriented Merit-based	"Macho" Individualistic Censure-oriented Power-based
Led	**Managed**
Long-term goals Clear, enduring mission Big picture-oriented Creative	Short-term objectives Mixed messages Detail-oriented Analytical
Ethical	**Amoral**
Visible ethics policies Ethical leadership and supervision Internal checks and balances	Tacit acceptance of unethical behavior Hiring for cultural fit No attention to reconciliation between systems

Figure 1

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The main stumbling block in project methodology is access to the real decision maker. As the anecdote in the beginning of this article indicates, the MIS manager failed partly because he took his orders from the vice-president. In that case, the plant manager turned out to be the real decision maker.

In this highly delegated environment, however, some important central functions may languish. The firm must maintain a central technology scanning or research and development function to stay abreast of changes in the field. Once such a function is established, a corollary problem is disseminating its results. One large, decentralized chemical company staffs its central high technology group with people who have both technical and strong consulting skills. It is their job to sell innovations to their business constituencies.

In an environment with ambiguous lines of authority and responsibility, "unowned," shared systems and large, tightly coupled systems fit well. Policies that substitute for individual operating decisions can be embedded throughout such systems. When these are managed by cross-unit steering committees, no single user has the authority to mandate substantial changes.

Because no one is really certain who will be making what decisions, users at all levels must have access to the most detailed data. MIS project methodology must deal with the resulting confusion. Consensus time and detailed walk-throughs should be built into all but the smaliest projects.

The same rules apply to whatever MIS planning is required. Planning is a consensual process, with MIS taking the lead to make things happen. In fact, MIS will find itself the agent of change on almost any front. This cultural bias should be reflected in MIS staff selection — strong "sales" personalities — and represents a structural risk in the ambiguous environment. A commitment to internal communications among a lean MIS senior staff substitutes for clear, articulated demand from the users.

Cooperative vs. competitive

Cooperative companies emphasize teamwork. People build strong relationships across organizational units and strata. Mentors abound, as senior people nurture and cultivate their subordinates to succeed them. Competitive firms place great importance on individual achievement. They are populated with "stars" who close big sales or produce hit shows. Japanese firms epitomize the cooperative culture. The stereotypical large law office or consulting firm is competitive.

"Owned," shared systems are consistent with a cooperative culture. These are systems that are shared among several operating units. Each has the freedom to go elsewhere, but they choose to share. To the extent that business conditions enable these users to cooperate, the versions of the system remain identical.

A cooperative culture is also fertile ground for systems that build corporate data — where one group enters data so that another can add to it or use it. Also appropriate here are systems that enable easy access not only to cross-unit data but to ways of analyzing it, such as template libraries. For ownership, systems must be decoupled. But for the

Entrepreneurial vs. conservative

	Entrepreneurial	Conservative
Types of systems	Ad hoc Easy to change State of the art	Proceduralized Hard to change Proven and burned in
Project methodology and tools	Prototyping Loose project definition Fourth-generation tools Heavy use of simulation	Traditional life-cycle methodology Strong project control Traditional language tools — Cobol
Planning and control	Top-down systems architecture Bottom-up system definition	Return on investment and risk assessment for all projects Strong charge-back system Steering committees for resource allocation
Organization	Resources dedicated to specific user areas Strong data administration and information systems training functions Staff of business analysts and technical wizards	Pooled resources for development Maintenance people dedicated to particular systems Superb data center operations network control Staff of solid technicians
Key issues for information systems	Prudent resource management Maintaining information systems as a professional unit Providing sufficient access to certified data	Enforcing technology followership Maintaining high-quality development staff Selling "soft" benefit projects

Figure 2

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best access to data, systems must be integrated. The architecture in a cooperative environment, then, is one of buffered integration and loose linkages.

Project methodology must be vitally concerned with shareability. Strict technology standards will ensure that users throughout the company can share software and data. In a similar vein, the MIS planning process must include a coordination step after the usual bottom-up effort. Personnel can be pooled, shared or moved across functions easily.

Implementing an architecture of shareable data and systems is not trivial. Strong central data administration, telecommunications and standards functions are critical. These groups can devote considerable energy to enabling broad access to certified data and to pacing the introduction of new technologies.

The competitive culture's separatism skews the MIS architecture toward single-owner sites with private data bases and strong internal security measures. Departmental computing prevails here. One large, competitive-culture firm had a separate data center for each business function — manufacturing, marketing and so on — and countless stand-alone minicomputer sites with Rube Goldberg-type telecommunications links between them.

The project methodology in a competitive culture must address security concerns in far more depth than other cultures require. In addition, existing systems should be periodically audited to ensure that they are operationally sound.

Cooperative vs. competitive

	Cooperative	Competitive
Types of systems	"Owned" shared systems Systems that build corporate information Easy-access systems Vehicles for sharing data and ways of looking at it	Single-owner systems Restricted-access data bases Strong internal security systems
Project methodology and tools	Technology standards enable later sharing New systems are integrated with, but buffered from, existing systems	Security issues addressed specificially in project methodology
Planning and control	Planning process includes coordination step after bottom-up effort information systems resources	Single executive manages overall information systems budget and approves unit plans
Organization	Dedicated resources but overall service attitude Moving between areas encouraged Strong data administration and telecommunications	Strictly dedicated resources Movement between areas discouraged
Key issues for information systems	Enabling data access and ensuring data quality across organizational lines New technologies introduced without roadblocking	Implementing standards Sharing systems and data Providing service when users' unit plans are overruled

Figure 3

To fit in this culture, information systems resources are thoroughly decentralized, with solid-line reporting and strongest loyalty to specific users. As MIS adopts the competitive "we-they" attitude, movement among information systems groups is difficult, and joint projects are virtually impossible.

Whatever overall MIS planning and resource allocation is done is the province of a single senior executive. In keeping with the culture, unit plans are approved or denied at this level, almost unilaterally. MIS shoulders the burden of maintaining its service image when business unit projects are cut.

The issues this culture raises for MIS are serious. Central functions such as standards, data administration, planning, R&D and telecommunications risk becoming empty and ineffective.

Led vs. managed

When a company is led, it has clear, long-term goals to pursue. It has a vision of the future; it is creative; and it cares about the "big picture." A firm that is managed focuses on financial objectives that are often shorter in term. Its statement of values depends on the problem at hand, yet it is a hotbed of the latest analytical techniques. Lee Iacocca's Chrysler Corp., despite its attention to financial matters, is led. IBM and Hewlett-Packard Co. are led. Colgate-Palmolive Co.'s ill-conceived "shopping spree" of the '70s reflects the fact that it was managed.

The interesting thing about companies that are led is that they know where they are headed and what is important to them in getting there. Armed with this knowledge, MIS can build systems that provide specific information support. This is what corporate data modeling is all about. Computer systems can deliver strategically selected information to decision makers at all levels. This stands in stark contrast to a leaderless firm, which sits with a pool of detailed data, unable to decide which elements are important and which are not.

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data administration function. Because the driving force is company direction, MIS staff should include business analysts to make the connection between corporate strategy and their daily activities. Among the MIS executive's most important roles is gaining access to strategic circles in the company, so it is imperative that the MIS executive be a leader in his or her own right.

Information requirements in managed companies change often because there is no substantive long-term direction. As a result, flat, detailed data bases must be maintained so virtually any question can be answered.

Managed firms are often concerned with their MIS spending as a percent of sales. The irony is that their short-term, financial objectives dictate expensive, detailed, central information sources. A short-term view — usually no more than one budget cycle — drives stopgap projects with shortcut methodologies.

No energy is "wasted" on standards and documentation; the focus rests with on-time, in-budget delivery of today's top-priority projects. This is an exceptionally difficult goal to meet because the priorities change with the caprice of daily business problems.

To succeed in this environment, MIS must maintain a fluid organization and follow the shifting priorities. In addition, MIS staff members should plan to complete all projects within a single budget cycle. Longer term efforts are simply outside the attention span of the "managed" business.

The main problem MIS experiences in a managed culture is keeping personnel. Turnover often exceeds 40% per year. Of course, this undermines MIS credibility because undocumented, nonstandard systems are passed from one set of inexperienced hands to another.

Emphasizing ethics

Ethical companies distinguish outwardly between right and wrong. Their policies emphasize honesty and fair play. An ethical firm would never condone an employee bribing foreign officials, even if it were the foreigners' accepted way of doing business. So-called amoral cultures are closer to Machiavellian ones. Success is deemed good, regardless of how it is brought about.

Led vs. managed

	Led	Managed
Types of systems	Picture-oriented systems Strategy-consistent data availability Projective systems	Flat, detailed, central data bases Historical systems
Project methodology and tools	Strategy-related objectives and criteria for success	Driven by short-term goals Financial emphasis — on-time and in-budget delivery paramount No project exceeds one budget cycle
Planning and control	Strategy-guided long-range plan	One-year plan that meets current budget constraints
Organization	Strong data administration function reporting high in the information systems organization Staff strength in business analysis	Fluid organization that constantly adjusts to changing goals
Key issues for information systems	Access to strategic circles Executive input for planning	Getting sufficient funding to do long-term projects Keeping personnel

Figure 4

Ethics start with people, but computer systems can be supportive, influencing high standards of behavior with internal checks and balances. This form of "policing" is actually much more palatable than audits and supervisory reviews. The more traditional approaches establish an atmosphere of defensiveness; people are seen as basically untrustworthy. Computer controls are automatic, quiet, depoliticized inspections.

Just as systems can support ethical behavior, an absence of computer controls is consistent with amorality. In one large high-tech firm, there was no automated (or even manual) system to ensure that what was shipped was also billed. There was no way to identify what capital equipment each department owned.

In that firm, company property commonly found its way into employees' homes. Sales representatives "loaned" units to favored customers. It is interesting to note that senior management turned to tighter computer controls for a solution.

In any analysis of culture, we must understand that a company is not homogeneous. Each division, sometimes each department, has a subculture of its own, even though the corporate culture is strong. MIS managers must take these into account as they plan culturally consistent activities throughout their realms. Many failures can be attributed to MIS' having projected the cultural bias of its parent organization onto the other units it supports.

Permanently on hold

ABC Co., a fictional subsidiary of a Fortune 100 manufacturing firm, was active in a variety of business sectors. It held a large market share in hospital supplies and had a strong franchise in several industrial lines. Its widely distributed consumer products unfortunately appealed to a steadily declining segment of the population.

Its sales had been flat for several years, and its profits were stable but softening. Some recent acquisitions, particularly in the hospital supplies area, brought in new products that ABC hoped would fuel future sales growth.

The company had a long-standing ethical and cooperative culture. Its lines of authority, however, were so ambiguous that it could rarely put together an organization chart. ABC was extremely conservative — risk averse and process- rather than action-oriented. Its managers' days were filled with meetings in which very little was accomplished.

In addition, ABC was effectively managed by the one-year financial goals placed upon it by its parent company. ABC had no spelled-out strategy or long-range plan; it had no leadership.

One of ABC's largest rivals was using information systems to strategic advantage by offering terminals to purchasing agents who placed orders directly into the firm's order processing system. ABC's MIS people worked with its marketing sponsor to outline a system that would allow ABC to catch up.

Together, they envisioned a fully functional system that would be owned by marketing. Both MIS and the marketing sponsor were justifiably excited by the challenge and opportunity this project presented.

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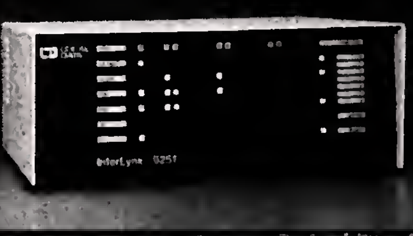

Over the course of the project, there was some personnel movement. The manager in charge of development transferred. A new supervisor was installed between the project leader and the new manager. The marketing sponsor left the company.

Despite these developments, the project leader pushed on, selecting a distributed architecture. A local vendor was to provide a turnkey system with communications links and a language that were new to ABC.

Breaking the rules

This project broke several cultural rules. First, the strategic system that they envisioned could not easily exist in a managed company. Secondly, the MIS department planned a distributed system. The firm's ambiguous lines of authority made the aberrant marketing champion a critical figure. Unfortunately, he had left.

In the aftermath, MIS failed even to convene a steering committee to shepherd the project. In short, they had no vehicle for building consensus. Finally, the lack of a chargeback system made it impossible for the department to tell the customer what the system cost. This uncertainty, in a conservative firm, proved untenable.

The outcome? A working system was delivered. But there were so many technical and political problems with it that it was placed in endless pilot and eventually deprived of funding. MIS was credited with a failure.

ABC's long-range MIS plan also called for installation of a complete set of integrated manufacturing resource planning (MRP) systems with a common data base technology. Again, the MIS department led the effort, convincing the manufacturing vice-president that the project would pay off handsomely in the long run. A one-plant pilot was approved.

The department tackled the project with enthusiasm and professionalism. The package was implemented; the skeptical plant manager was converted to an ally; and the benefits were counted. All this took about a year.

The MIS management prepared a presentation for senior management to try and gain approval for the next step. The price tag was $30 million, and the payback period was eight years. The project was turned down cold.

The MIS professionals had committed two fatal cultural errors. First, they had embarked on a multiyear plan in a managed, short-term-oriented company. To fit comfortably into this kind of environment, any project must be funded within a single budget cycle. Otherwise, it risks having funds cut off midstream.

In a related error, MIS undertook an effort with visible costs and less tangible benefits. Managed conservatives become very nervous when asked to fund projects with long paybacks of soft benefits.

The MRP II project was left in endless pilot as the MIS group was sent off to find a microcomputer solution that could be implemented on a shoestring.

A common mistake

XYZ Corp. was a high-tech firm growing at a 35% compound annual rate. Although only in its second decade, its market success had brought it into the Fortune 200.

> ”
>
> *Very few of the tools for influencing culture are so easily engineered as information systems. Non-MIS tools are extremely influential but their implementation is often longer term.*

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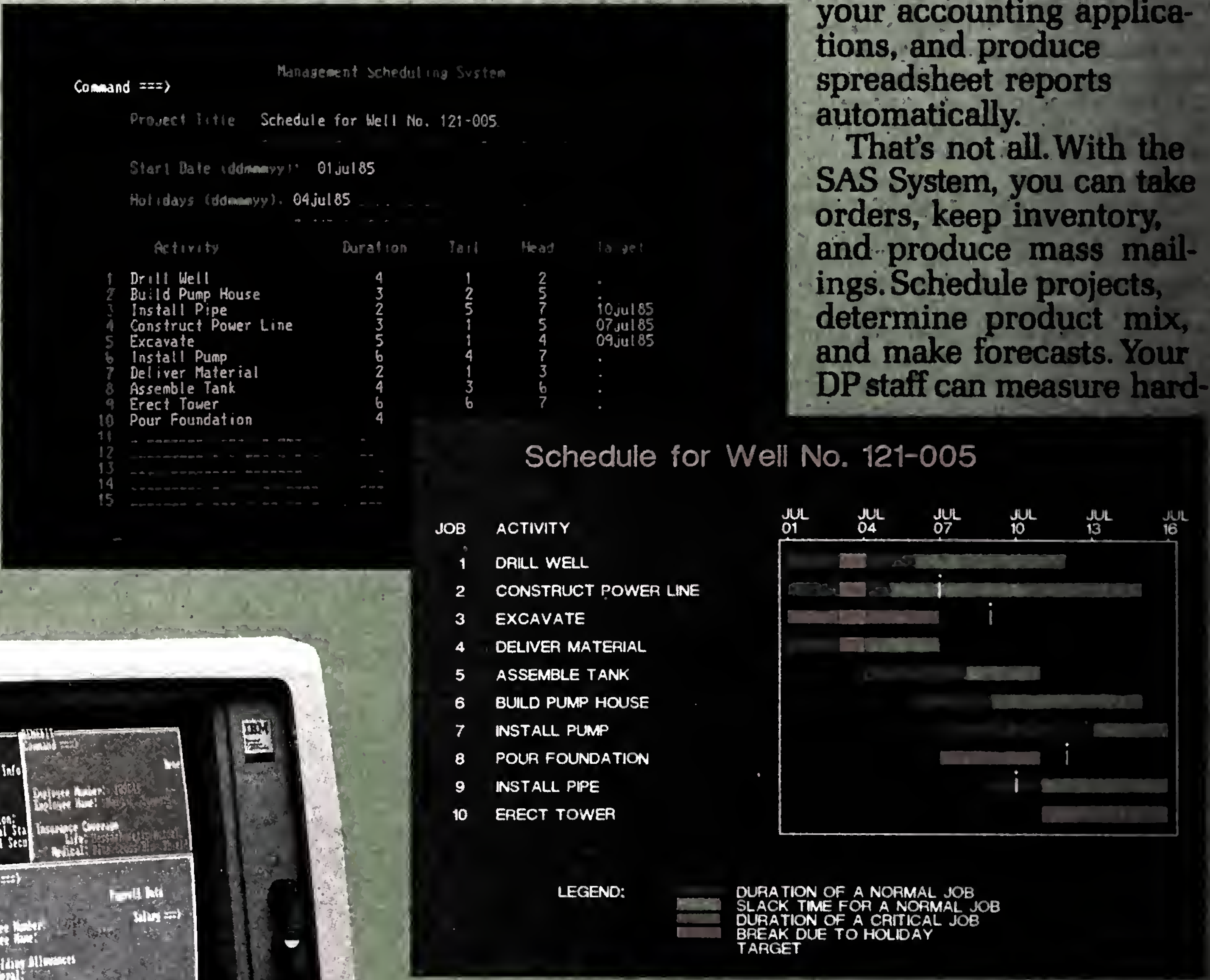

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                         Management Scheduling System
Command ===>

     Project Title   Schedule for Well No. 121-005

     Start Date (ddmmmyy):  01jul85

     Holidays (ddmmmyy). 04jul85

        Activity                Duration     Tail     Head     Target

  1  Drill Well                     4          1        2      .
  2  Build Pump House               3          2        5      .
  3  Install Pipe                   2          5        7      10jul85
  4  Construct Power Line           3          1        5      07jul85
  5  Excavate                       5          1        4      09jul85
  6  Install Pump                   6          4        7      .
  7  Deliver Material               2          1        3      .
  8  Assemble Tank                  4          3        6      .
  9  Erect Tower                    6          6        7      .
 10  Pour Foundation                4
 11
 12
 13
 14
 15
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                 Schedule for Well No. 121-005

JOB   ACTIVITY                 JUL   JUL   JUL   JUL   JUL   JUL
                               01    04    07    10    13    16
  1   DRILL WELL
  2   CONSTRUCT POWER LINE
  3   EXCAVATE
  4   DELIVER MATERIAL
  5   ASSEMBLE TANK
  6   BUILD PUMP HOUSE
  7   INSTALL PUMP
  8   POUR FOUNDATION
  9   INSTALL PIPE
 10   ERECT TOWER

      LEGEND:        DURATION OF A NORMAL JOB
                     SLACK TIME FOR A NORMAL JOB
                     DURATION OF A CRITICAL JOB
                     BREAK DUE TO HOLIDAY
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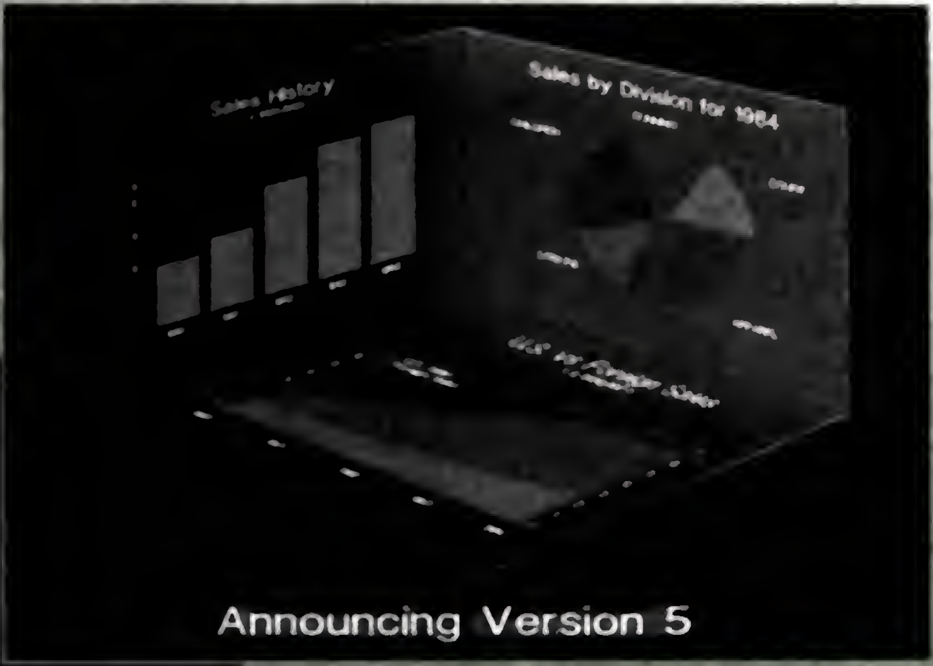

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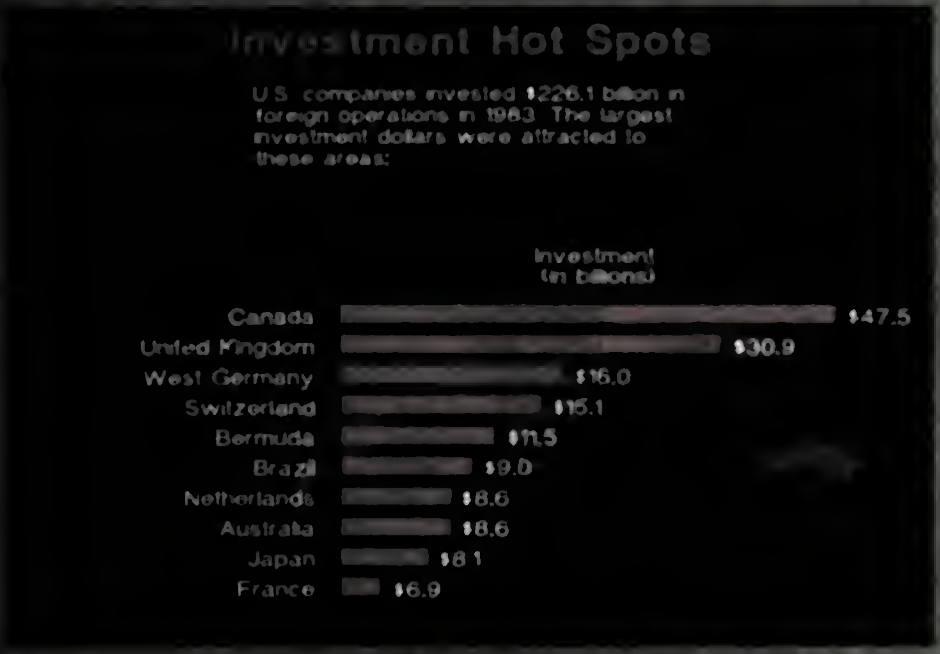

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The culture was, above all, entrepreneurial. It was ethical and competitive, with ambiguous lines of authority held over from its days as a smaller company. The original founder continued to lead the company with a clear, well-articulated vision for the future.

> ”
>
> *Xerox used to be considered entrepreneurial but now might be seen as conservative. AT&T is trying to change from conservative to entrepreneurial.*

Because of its rapid growth, XYZ had outstripped the capacity of its core transaction processing systems. The director of MIS began a project to address order processing, billing, accounts payable and accounts receivable. As one might expect, MIS managed the project with a well-controlled, traditional life-cycle method.

A user manager was named to participate fully in the project team, and a respected consulting firm was hired to define and document the requirements. Their superior expertise was retained for general and detailed system design and for programming. After three years, three major design revisions and about $30 million in out-of-pocket expenses, there was still no system. After the third year, the name of the project was changed to conceal the continuing disappointment.

Where did MIS plans go awry? In an entrepreneurial firm, the traditional MIS approach is dead wrong. Even though the systems they were building were traditional transaction processing systems, the MIS team should have been using a prototype approach.

Possibly the only way to satisfy these users would have been to define a broad architecture, then begin roughing in the pieces with high-level languages and packages. With rapid deliveries and an evolutionary attitude, MIS would have been able to keep pace with the needs of a changing business.

The first assignment given to the new MIS manager of XYZ was to investigate a stalled project and recommend an action plan. As he looked into the matter, he found two camps arguing over which software package to implement.

On one side, the user had selected a clearly superior package that was consistent with the way she did business. On the other side of the argument was the MIS director. He wanted to implement the system that was already being used worldwide for similar functional groups. Although the package was an older batch-type system, the MIS director believed consistency would serve the whole company better than a little extra capability in one group.

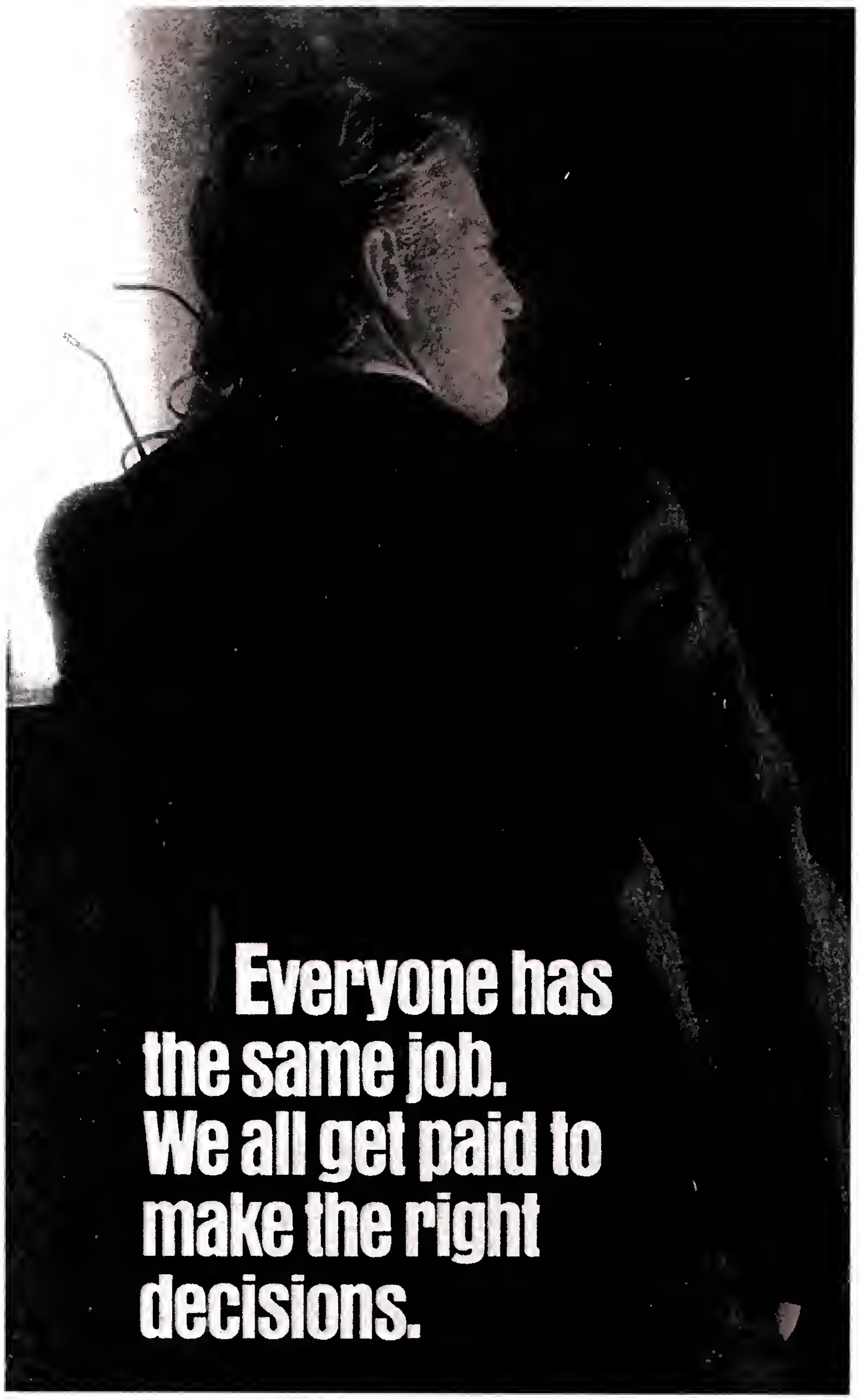
The MIS manager backed the user's choice rather than his superior's. Although he had compiled a thorough analysis of both systems, the real reason for his decision was cultural. He perceived the culture to be individualistic and competitive, not cooperative. In that environment, the key to success is meeting the needs of the user. Period.

Culture building

In general, MIS professionals can be more successful by identifying important aspects of their corporate culture and adjusting their policies and approaches to fit within the environment. Sometimes project success is a matter of changing only a few key, countercultural practices that have stymied solid efforts at progress.

Culturally consistent MIS activities will benefit the corporation by strengthening and solidifying the firm's culture. Obviously, MIS activities alone will not drive culture. They can, however, make a significant contribution toward influencing behavior and then values, as part of a coherent, culture-building program.

At the same time, MIS can participate in influencing culture. As we saw in the vignettes above, some of the cultural attributes of ABC Co. and XYZ Corp. were undesirable. With careful planning and the support of executive management, MIS professionals can play an important role in helping a firm modify its values.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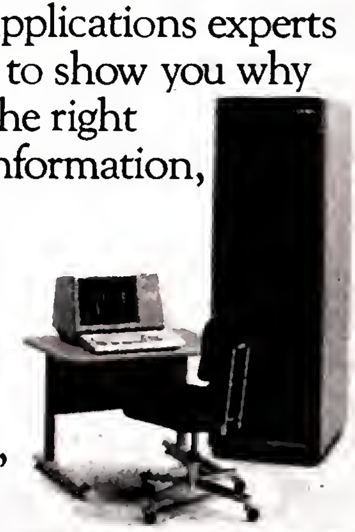

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Software maintenance: penny wise, program foolish

By Girish Parikh

U.S. programmers shave days off software development time while squandering weeks on ad-libbed software maintenance. Soviet and Japanese companies have a jump on developing rigorous methods.

Computer professionals still ignore software maintenance. For software development, there are at least some methodologies, even if U.S. companies are drifting from them. But for software maintenance, there are no systematic methods in place yet.

The ideal way to systematize software maintenance would be to build techniques into the software development methodologies. Today most development facilities avoid dealing with the maintenance phase, and in this respect, they are incomplete. Judging from the alarming software maintenance statistics — 50% of DP budgets allocated to maintenance, more than 50% of programmer time consumed by ongoing maintenance, and more than $30 billion spent on maintenance annually worldwide — the omission is critical.

The pervasive lack of attention to the subject persists on a national level. The much-touted race between Japan and the U.S. on developing fifth-generation computers receives wide publicity. But the one-sided competition in software maintenance, which may affect the eventual outcome of the fifth-generation race, simply is not addressed by most computer professionals in the U.S.

Software maintenance consumes substantial resources. By streamlining and automating this work, the saved resources can be diverted elsewhere — toward developing applications for fifth-generation computers. Japan seems to understand the software maintenance problems and is making moves to solve them, as evidenced by the Software Maintenance Engineering Facility project under development by the Joint System Development of Japan.

The U.S. is perhaps more aware of the Soviet Union's threat to American technological supremacy regarding software. The fear seems to be: "The Russians are coming! The Russians are coming!" It seems to me that almost any country, even a developing one, can surpass the U.S. in the software field simply by making software reliable and modifiable and by developing modification techniques that can be taught.

On a company level, what is the effect of lack of attention to software maintenance for a data processing manager? The impact may or may not be immediately visible; however, the long-range effect can be devastating. When management considers maintenance a low-priority activity, the staff doing maintenance gets the message immediately.

In most companies, development programmers also handle maintenance. Instead of using systematic maintenance processes and updating documentation, they rush through the work by patching the programs so they can get back to development work quickly. Over time, the programs become almost impossible to modify, and documentation deteriorates.

Cleaning up the maintenance mess will be much more difficult and expensive than preventing it in the first place. By instilling "positive maintenance attitude," by encouraging the use of software maintenance techniques and tools and by providing maintenance training, many problems can be avoided.

Weak foundations

I have been through the software maintenance trenches for several years and observed the weak foundations of many applications systems. At the moment, U.S. software consists of precarious skyscrapers of unstructured and disorganized code on the verge of collapsing under severe maintenance problems. A better balance cannot be attained unless these basic problems — not just the symptoms — are promptly solved, and new software is developed with a methodology that includes teachable modification techniques.

You cannot avoid software maintenance: It is intrinsic to software. Why not do maintenance right and avoid the problems?

To be complete, software methodologies must offer exact guidelines for maintaining the software

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Girish Parikh is a Chicago-based consultant, lecturer and writer. His newest report, "There Is A Fortune To Be Made In Software Maintenance: Opportunities in the $30 Billion Software Aftermarket," is published by Shetal Enterprises, Chicago.

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> *U.S. software consists of precarious skyscrapers of unstructured and disorganized code on the verge of collapsing under severe maintenance problems.*

developed with those methods. That way, the original structures are preserved, and maintenance operations can continue effectively, efficiently and economically. A methodology that can help solve the maintenance problems of unstructured software, as well as provide guidelines for maintaining structured software, would be even more useful.

Further, a country can develop national standards for software development and modification. There is already at least one technology eminently suitable for such standardization: Jean Dominique Warnier's logical methodology. The French systems scientist's technique of designing programs, called logical construction of programs (LCP), is such that any LCP programmer can maintain almost any LCP program anywhere.

To my knowledge, Warnier's methodology is the only one that provides precise guidelines for modifying programs; even more important, the modification techniques can be taught. Imagine how much maintenance saving can be achieved by such national standardization and education.

In searching for the root of the problems, some have named Fortran and Cobol as the culprits responsible for the development and maintenance problems. I do not think this is the case.

Although the trite phrase "It's the fault of the computer!" is a popular one, we have all learned that the program can also be at fault. In fact, in almost all cases the program is at fault; all things considered, it is relatively rare that a computer malfunctions. So we changed our strategy and started blaming the "bug" in the program. But from where did the bug come?

Whodunit

Of course, a high-level language or any language that helps develop clear structures can help prevent or eliminate bugs. However, to a large extent it is the program design that makes the difference. So if the program is poor, it's generally the fault of the program design or rather the fault of the programmer who did a poor job of designing. Or, in an all-too-familiar scenario, it is the fault of the programmer who did not even care to outline the program before starting to write code.

In a worst-case sense, this is like rushing to start building a house before preparing a blueprint. It will be a miracle if the house is built at all, and if it is built, it may not be functionally sound or even safe. And such a house, if it gets finished at all, would cost a fortune to build, not to mention its subsequent maintenance. How many times would it be torn apart and construction started all over?

Applying this same principle to coding without preparing a design outline, we see that maintenance for these programs is even more awkward than usual. The difficulty is intensified because typically there is no adequate documentation to support the maintenance effort.

Again I must point out that Warnier's LCP technique can help design optimal (efficient in memory usage and execution speed), clearly structured, well-documented, reliable and easily modifiable programs. Programmers can code in Fortran, Cobol or almost any other programming language using LCP, because the design technique is independent of programming language and hardware.

LCP programs can save a bundle in the long maintenance cycle, starting in the initial development stage. The technique saves in testing time during development and maintenance, as programs work on first or second effective test. Since, in

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the traditional development cycles, testing takes about 50% of resources and time, LCP techniques can save a bundle in initial testing alone, not to mention the continuing saving in the maintenance cycle. In addition, program modification techniques can be taught.

Learning on the fly

One observation illustrates how deep the maintenance problems reach. It may sound ridiculous to non-DP executives, but it is a fact that in many large companies it takes about six months for a programmer to be productive in maintenance work. In the end, such work usually amounts to more than half of a programmer's responsibilities.

Without formed methodologies, many of these programming professionals lack formal training in software maintenance, and they are forced to learn on their own. This pickup, on-the-job training does allow them to complete the assigned work.

But maintenance skills learned the hard — and expensive — way, if they are learned at all, are generally not of much use when programmers hop jobs. Statistics quickly reveal the implications: Programmers change jobs every 1½ years on the average. In all likelihood, they then spend another six months learning how to use the nonstandard maintenance techniques of their new posts.

Ironically, the frustrating maintenance work itself contributes to the high programmer turnover. What a colossal waste of programming resources! It is easy to see why backlogs for new systems now amount to years in length.

Most companies contribute to this wasteful cycle by failing to take software methodologies seriously. Just look at the DP job section in the Sunday newspaper of your city. How many companies look for designers and programmers with experience in a certain methodology? Most advertisements specify skills in programming languages (usually Cobol and even Bal) and some software packages such as CICS and IMS, but not in software maintenance techniques.

We may be seeing a symptom of a deeper phenomenon. The concern of many DP managers seems to be to get the development job up and running, to get a pat on the back and maybe a promotion and a raise. If the system doesn't work out or if a time comes for them to modify or maintain their brainchildren, there is almost always another job to go to instead.

The concern of the U.S. still seems to be focused on the front-end work of development, even though software maintenance is estimated at 67% of the software life cycle. There are an estimated one million programmers in the U.S. alone, most of whom are spending more than half of their time on ongoing maintenance. But most training programs address only development issues. How much programmer time and resources are wasted doing trial-and-error maintenance, not to mention losses incurred because of incorrect changes?

Creating new methods

Though maintenance work is influenced by the development method used, (typically ad hoc method — that is, no method at all) we need to address maintenance problems on their own terms also. For a given development method, we should create maintenance techniques drawn from that method.

The task of creating maintenance techniques for unstructured software, developed without using any method, will be a challenge. But if we want to close the software maintenance gap, we must deal with these problems by treating the causes, not just removing the symptoms.

There are several options available for dealing with unstructured code, such as redeveloping, replacing with an off-the-shelf package and restructuring. In addition to techniques for maintaining software treated with the former options, techniques are also needed to handle maintenance work on the unstructured software as it is.

Understanding software becomes one of the keys to making correct changes. With unstructured software, maintenance programmers spend about half their time just understanding the programs. If the tools and training are developed to expedite standing of unstructured software, companies will realize a significant saving.

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> *Programmers change jobs every one-and-a-half years on average. In all likelihood, they then spend another six months learning the maintenance techniques of their new posts.*

Recently a debate has started about the validity of current terminology. An excerpt from Dr. Edsger W. Dijkstra's privately published newsletter "EWD" in May 1983 pointed out that "maintenance" itself is a misnomer: "To begin with, a program is not subject to wear and tear and requires no maintenance." Dijkstra coined the term "structured programming" but has not coined a new term for maintenance; he simply laments over the established one. Yet the term "program maintenance" has been in practice since electronic computing began over 30 years ago.

My question to those who have started debating over the term now is, where were you all this time? Of course, most of us were preoccupied with other computer topics — especially development. Though maintenance work was and is being done by programmers around the world since the dawn of electronic computing, no one seems to have paid much attention to it or even to its name.

Was it laziness? Or did we have a misconception that by developing methodologies for the front-end development, software maintenance would naturally fall in place? Did we simply not have the foresight to worry about the future, to see what was going on below the surface in the real world?

Perhaps the reason lies in programmers' general dislike for software maintenance. Some even hate the work. They want to remain high on the excitement of new development. It is a challenge to solve a problem by developing a new program. But once the program is installed, the excitement abates; programmers start seeking new pastures to satisfy their appetite.

Unfortunately, they have to work on existing programs. After all, these programs were their (or their fellow professionals') brainchildren, and they cannot abandon them. There are heavy investments in existing software, and management wants to make the most of it. So programmers grudgingly carry on, correcting errors, modifying code, adding new requirements, adapting to new software environments and so on.

Instead of changing the label, why not develop a generally accepted definition of the term and go on — identifying the variety of topics and subtopics on and related to the subject. In other words, develop a taxonomy, define the terminology for the subject and then get on to the more important work of developing software maintenance methodologies, both technical as well as managerial. With a generally accepted terminology, we will be able to communicate with the world at large.

Time to act

In 1981 the National Science Foundation commissioned a group of industrialists, scientists and teachers, known as the Computer Science and Engineering Research Study. Their study yielded a report that aptly predicted the threat to U.S. dominance in the software field:

"If software practices continue to drift, in 20 years the U.S. will have a national inventory of unstructured, hard-to-maintain, impossible-to-replace programs written in Fortran and Cobol as the basis of its industrial and government activities. Conversely, the Soviets may very well have a set of well-structured, easily maintained and modifiable programs in more modern languages because, in fact, they plan to leapfrog Fortran and Cobol.

"In this case, the competitive process of selecting efficient industrial processes among feasible alternatives will be impaired in the U.S. but facilitated in the USSR. We could then face a software gap more serious than the missile gap of some years ago."

Since then, it seems that fear has acted as catalyst for the U.S. Department of Defense to start the Software Engineering Institute centered at Carnegie-Mellon University in Pittsburgh. The institute plans to hire some 250 engineers to conduct a study of software methods and their applicability to defense systems. But it remains to be seen how the Software Engineering Institute tames the giant of software maintenance.

It seems that even in 1985, not much attention is being paid to software maintenance. It is naive to believe that by working on front-end development methodologies, the software maintenance problems will go away. In fact, if development is the front side of the coin, software maintenance is the other side, which stays much longer in view.

We are more than 30 years behind when it comes to software maintenance. We have awakened late. The giant subject of software maintenance may prove to be even larger than development and harder to tame. We have created enough mess with the existing software. Now instead of skirmishing around with the term, let's get started on the real work — honing the subject into an engineering discipline, developing software maintenance tools and producing educational and training courses and materials.

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MICROCOMPUTERS

Rockwell signs unlimited license pact

Agreement authorizes duplication of Smart

By Eric Bender

OVERLAND PARK, Kan. — An unlimited software site license agreement, signed this summer, was recently revealed by Innovative Software, Inc. and Rockwell International Corp.

The deal gives Rockwell, which employs more than 100,000, perpetual worldwide rights to copy Innovative's Smart Software System, a series of integrated modules for the IBM Personal Computer and compatible systems.

Creating a standard for Rockwell, the arrangement will provide several important advantages, said Gordon Armour, staff specialist for emerging technology at Rockwell Defense Electronics Operation's information systems group in Anaheim, Calif.

According to Armour, these will include greater interchangeability of personnel, easier interchangeability of files, the development of expertise with specific programs, general availability of high-quality software tools, a chance for broadened user training, the ability to create ancillary products and "the obvious economic benefits."

Rockwell, which expects to sign a similar deal for another type of micro software next year, did not disclose financial terms or release estimates of the number of personal computers involved.

In fact, the Fortune 50 firm did not disclose details on the magnitude of its micro installations to Innovative, which complicated initial negotiations. "That was the first hurdle we had to get over," Innovative Marketing Vice-President Ron Ferguson told *Computerworld*. "If you find out, I'll be glad to read about it."

However, Ferguson said, it made sense to sell a license as a service to an organization, as mainframe software may be sold, rather than by number of machines. "We as an industry may be setting some artificial limitations in terms of selling our services to this segment of the market."

Under the agreement, "Rockwell has the right to duplicate and use the programs as they exist today; all else is unbundled," he said. Other contracts give Rockwell options to buy documentation updates or support from Innovative.

After duplicating the programs from master disks provided by Innovative, Rockwell will distribute and control the software internally through technical libraries. "We will have rigorous control procedures at the technical libraries," Armour emphasized. One benefit of these procedures is that as Smart Software enhancements come along, "we can simply pump the updates downstream," he said.

All software will have a special screen tailored for the company and an individual serial number, Ferguson noted. Although "we do not prohibit user copying, Rockwell does not want them to do it from the perspective of control of updates," Ferguson said. Users will be reminded that the software is a corporate asset and that they are not authorized to copy it.

"With the employer behind that, there will be much less misuse within the organization," Ferguson said.

SMALL TALK
Eric Bender
CW Senior Editor

Micro vendors willing to deal

The year 1985 has been far from a gangbuster one for microcomputers so far, but the landscape is changing lately — most noticeably in software licensing.

After a year and a half of sound and fury about site licensing, we're starting to see some significant activity. Behind the flurry of announcements, which turned out to be simple volume purchases (stop the presses!), are coming deals with genuinely different contractual arrangements.

One example is Innovative Software, Inc.'s recent agreement with Rockwell International — a perpetual, worldwide unlimited license for the Smart System software (see above story).

Controlling micro software

Negotiations may be a lengthy, complicated process — for example, Rockwell would not tell Innovative exactly how many micros were installed — but they hold the promise of coming up with a more sensible way for corporations to buy, distribute and control micro software.

We're also seeing a host of vendors dropping copy protection. Many of these are tiny firms, struggling to stay alive in a slow market that has created some significant disappointments even for stars like Lotus Development Corp. But regardless of vendor motives, dropping copy protection makes life a little easier for corporate users.

Microsoft Corp. bit that particu-

Continued on page 66

Software Publishing enhances PFS:Write word processing

Software Publishing Corp., based in Mountain View, Calif., has enhanced its best-selling PFS:Write word processing package for the IBM Personal Computer and compatible systems, providing an integrated spelling checker, wider documents, additional character enhancements, microjustification, context-sensitive Help screens and a quick-save feature.

Available now at the same retail price of the previous version, $140, the upgrade uses features requested in 1,500 responses to a customer survey that Software Publishing carried out earlier this year, according to product manager Dave Burns.

PFS:Write's spelling checker uses a 75,000-word dictionary to correct documents for misspellings, typographical errors, repeated words and irregular capitalization, according to the vendor.

The package now supports documents up to 250 characters wide and offers added character styles such as italics, superscripts and subscripts.

The quick-save feature permits users to save documents with a single keystroke during editing, rather than requiring them to go out to the main menu, Burns noted.

Current PFS:Write customers can upgrade to the new version for $35, according to a company spokeswoman. Software Publishing also is offering the software bundled with PFS:File, PFS:Plan, four utilities and two diskettes for $350.

PFS:Write requires IBM's PC-DOS or Microsoft Corp.'s MS-DOS 2 or higher and 256K bytes of random-access memory.

Software Publishing declined to give sales figures for PFS:Write, although it noted that independent research by Software Access International, Inc., a Mountain View firm, found that the software is the most popular word processing package available for less than $300. More than 1.7 million PFS series packages have been shipped, the spokeswoman said.

Ven-Tel takes wraps off modem

Internal, stand-alone versions offered for IBM micro families

Ven-Tel, Inc. of Santa Clara, Calif., has announced a 2,400 bit/sec. modem for the IBM Personal Computer series in both internal and stand-alone versions, both priced at $695.

The Half Card 24 expansion card reportedly provides communications for the micro at 2,400, 1,200 or 300 bit/sec. The card fits in a short slot in the Personal Computer XT and uses the standard Personal Computer AT command set.

Half Card 24 is said to be fully compatible with Ven-Tel's Half Card 1,200 bit/sec. modem and the Hayes Microcomputer Products, Inc. 1200B. It also supports software available for 1,200 bit/sec. modems and comes packaged with Microstuf, Inc. Crosstalk XVI communications software.

Other features include local and remote test modes, call progress reporting, automatic speed selection and automatic fallback to 1,200 bit/sec. when calling another modem operating at the lower speed.

A spokesman for Ven-Tel said the 2400 Plus stand-alone modem is fully compatible with the Hayes Smartmodem 1200 and the Ven-Tel 1200 Plus. The autodial, autoanswer modem can operate in both asynchronous and synchronous modes.

The stand-alone modem also includes automatic fallback, compatibility with 1,200 bit/sec. software, local and remote test modes and call progress reporting. Both the stand-alone and internal products are AT&T Bell Laboratories 212-A compatible at 1,200 and 300 bit/sec. and V.22bis-compatible at 1,200 and 2,400 bit/sec.

- ■ Gateway Communications rolled out a series of micro-to-micro and micro-to-mainframe communications packages/**58**
- ■ An expansion system that gives four-user capability to the IBM Personal Computer AT running PC-DOS was introduced by Anex Technology/**58**
- ■ Samna enhanced its Samna+ integrated software/**59**

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Micro communications package debuts

VM Personal Computing, Inc. of Danbury, Conn., has introduced and shipped Relay Gold, a microcomputer communications software package said to provide multitasking, a new-generation script language, full menu- or command-driven operation, flexible screen scroll-back and a learning mode.

The $225 program is available for all versions of the IBM Personal Computer, IBM-compatible systems, the Data General Corp. Data General/One and the Wang Laboratories, Inc. Professional Computer.

Unlike most other communications software, Relay Gold permits users to continue working on an application while files are being transferred, the company said. The software also allows personal computer users to send a file, receive a file and exchange messages with each other simultaneously.

Script language

The script language allows users to write a script of commands for Relay Gold, using features such as conditional waiting and branching, variable handling and error trapping, according to VM Personal Computing. This reportedly permits the software to handle virtually any communications task.

In micro-to-mainframe communications, Relay Gold is said to allow either the micro or the mainframe to control the operation, permitting cooperative, distributed and multisite processing. Binary, text and data files can be uploaded or downloaded to and from IBM mainframes using the vendor's Relay/3270, with error detection and correction maintained in both directions, the vendor said.

Relay Gold emulates TTY, DEC VT100 or VT52 and IBM 3270 terminals. The software supports the public-domain Kermit and Xmodem protocols in addition to its own bidirectional protocol. Modems are supported from vendors including Hayes Microcomputer Products, Inc., AT&T, Penril Corp., Prentice Corp., Racal-Vadic, Inc., Rixon, Inc. and Telenetics Corp.

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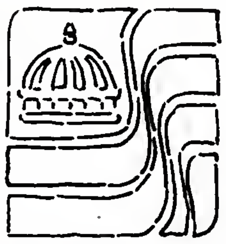

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Tools link IBM micros

Gateway Communications, Inc. of Irvine, Calif., has unveiled a series of micro-to-micro and micro-to-mainframe communications link software packages for the IBM Personal Computer line. The products were developed by Network Software Associates, Inc.

The five products in the G/SNA series reportedly allow the IBM Personal Computer, Personal Computer XT and AT to communicate with each other and with a mainframe in the IBM Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) environment at speeds up to 19.2K bit/sec.

G/SNApc 3270 allows the micro to access an SNA host by emulating an IBM 3274 controller equipped with a 3278 or 3279 terminal and 3286 or 3287 printer. It sells for $585.

G/BSCpc 3270 permits 3274 emulation in a bisynchronous rather than SNA/SDLC environment and costs $475.

G/SNApc 3770 emulates an IBM 3770 remote job entry workstation for mainframe access, allowing the micro user to submit a mainframe job request and to download, locally process and upload mainframe data. It costs $585.

G/SNA PCcom is a direct micro-to-micro link using the SDLC protocol and including interactive message exchange, file transfer and remote/local IBM PC-DOS command capabilities. It is priced at $475.

G/SNApc Combo provides 3270 and 3770 micro-mainframe communications for a price of $795.

Anex unveils expansion unit

Anex Technology, Inc. of Congers, N.Y., has announced an expansion system that reportedly gives four-user capability to the IBM Personal Computer AT and other Intel Corp. 80286-based micros running IBM's PC-DOS or Microsoft Corp.'s MS-DOS.

The basic configuration of Multi-AT/4, priced at $1,695, includes an eight-slot expansion chassis to support IBM-compatible keyboards and monitors as workstations, a hookup for a second workstation and Anex Multi-DOS, the multiuser software enhancement for PC-DOS.

The chassis is said to provide for memory expansion of up to 640K bytes for each workstation with Anex Multi-RAM memory expansion cards.

The Multi-DOS software replaces selected system calls with new code for faster response time at the same processor speed, according to the vendor. Each workstation is said to maintain the same performance of a stand-alone micro, regardless of the number of workstations running on Multi-AT/4.

Each workstation is able to run the same or different programs concurrently and transparently. PC-DOS-compatible programs can run on any or all of the workstations, Anex said.

Samna upgrades tool to aid data transfer

Samna Corp. of Atlanta has announced an enhanced version of its Samna+ integrated software that reportedly supports the Document Interchange Format (DIF) for easier data transfer with other spreadsheet packages.

Release 3.1 of Samna+, the so-called Turbo version, is said to perform common operations faster than Release 2.11. DIF support facilitates the exchange of Samna+'s word processing, word-base management and spreadsheet data with Lotus Development Corp.'s 1-2-3 and Symphony.

Samna+ Turbo is targeted for IBM Personal Computer users producing extensive documents with numerical data. The software requires a minimum of 415K bytes of memory, excluding the requirements of the PC-DOS operating system.

The product is priced at $695. Users of Release 2.11 may upgrade for $50 or at no cost if they purchased the previous release after July 23.

Interactive enhances PC Screen

Interactive Data Corp. of Waltham, Mass., has announced an enhanced version of PC Screen — the IBM Personal Computer, Personal Computer XT and AT software interface for the vendor's Standard & Poor Corp. Compustat financial data base.

Version 2 features code rewritten in Lattice, Inc. C language that is said to halve the software's response time. Increased calculating power reportedly allows processing of nested match calculations.

PC Screen examines data on publicly traded companies according to criteria set by the user, including available variables, ratios or user-defined calculations.

PC Screen requires a micro with a minimum of 256K bytes of memory and the user's subscribed access to Compustat.

PC Screen Version 2 is available to current users free of charge. The annual license fee for Interactive Data's financial service is $15,000 for the first user in an organization and $7,500 for each additional user.

Corona Data gives micro MS-DOS, net

Corona Data Systems, Inc. of Thousand Oaks, Calif., has announced that its shipments of the Mega PC micro after Oct. 1 will include the Microsoft Corp. MS-DOS operating system with the MS-Net local-area network software.

The bundled software reportedly allows the Mega PC to expand to up to eight user workstations.

The new operating system and local-area network are included in the price of all Mega PC systems. Current users of MS-DOS 2.11 on the Mega PC may upgrade to DOS 3.1/MS-Net free of charge.

Prices for the Mega PC are $5,345 for the 10M-byte hard-disk version and $1,675 for each additional workstation.

SOFTWARE

■ Information Technologies, Inc. has cut the price of its terminal emulation software for the IBM Personal Computer line.

The firm's Linkup System Coax reportedly enables an IBM Personal Computer to connect to an IBM 3274 or 3276 controller and to emulate an IBM 3278 or 3279 terminal.

Linkup System Coax now sells for $495. The product previously sold for $995.

Information Technologies, 7850 E. Evans Road, Scottsdale, Ariz. 85260.

Continued on page 60

TI announces the portable sales tool for General Electric Plastics' field communications.

Instant access with their technical data base and 24-hour communications with headquarters. That's what the SILENT 700™ Model 707 with its easy access module means to GE Company's Plastics Sales Division. Regardless of time zones and sheer distance from the home office, GE Senior Sales Representative Ray Forester can get the latest product data and cost analysis information he needs to prepare for and close a sale. All he needs is his TI 707 portable data terminal and a telephone.

"With the terminal, I can tap into GE Plastics' data base. When ERIS (Engineering Resins Information System) is accessed by my TI 707, I can provide a customer with technical information and product specifications on the spot and leave him with a printout to review.

"The terminal also acts as my message center when I'm in the field. I transfer messages through the GE Crossfile (electronic mail), and the individuals receive them in written format when they pick up their messages. They seem to respond more promptly with accurate, hard copy in front of them. And since I can receive messages anytime, anywhere, the TI 707 all but eliminates 'telephone tag.'"

Ray Forester believes that the TI 707 is ideal for the salesman on the go. It's lightweight and rugged, takes up approximately one half of a briefcase, and is quiet even at peak operation. "It's exactly the productivity tool we needed for our division's field communications," he concluded.

Find out about the Model 707 SILENT 700 Portable Data Terminal from TI and how it can solve your communications problems. Call 1-800-527-3500, ext. 709; in Canada, 416-884-9181. For more information write TI, P.O. Box 809063, Dept DTB 1930W, Dallas, Texas 75380-9063.

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Software

■ **Boston Business Computing, Ltd. (BBC) has introduced software permitting Digital Equipment Corp. VAX mainframe editing functions to be performed on micros.**

The program, BBC PC/EDT, is said to provide the functionality of VAX EDT Versions 3 through 17 for DEC PDP-11 and of VAX/VMS Version 4 on the DEC Rainbow, the IBM Personal Computer, Personal Computer XT, AT and compatible computers.

Editing features include multiple buffers; undelete line, word and characters; and redefine keyboard.

Users can execute PC-DOS or MS-DOS commands from BBC PC/EDT, the vendor claimed. The software supports directory and subdirectory commands for PC-DOS or MS-DOS Versions 2 and higher and requires one disk drive plus 128K bytes of memory.

BBC PC/EDT costs $200, the vendor said.

BBC, P.O. Box 121, 1211 N. Main St., Randolph, Mass. 02368.

■ **Software for plant and facility maintenance that runs on the IBM Personal Computer XT and AT is available from Project Software & Development, Inc.**

Called Maximo, the package is said to perform work order tracking, inventory control and equipment history applications for a range of sites, including manufacturing sites, hospitals and universities.

Maximo uses a mouse and menu-driven screens that users can design by adjusting parameters such as length and field descriptions. A report writer produces predesigned or user-formatted reports containing data for work orders, inventory or equipment history, the vendor noted.

Written in the C programming language, Maximo runs on the IBM PC-DOS 3 operating system and requires a hard disk and 640K bytes of internal memory. Maximo is available as software only or as a turnkey system. The software-only package includes the program, reference manual, tutorial and mouse for $17,900.

Priced at $22,900, the turnkey system includes the software, a 640K-byte IBM Personal Computer AT, 20M-byte hard disk and color monitor with Personal Computer interface.

Project Software & Development, 20 University Road, Cambridge, Mass. 02138.

■ **Decisionex, Inc. has unwrapped a program that runs on the IBM Personal Computer and compatible systems for calculating the cost of renting commercial space.**

Called Tencost, the program projects all costs of occupancy associated with a single lease from the corporate tenant point of view by accounting for actual or proposed lease provisions and by comparing alternate lease proposals on a present value or level rent annuity basis, the vendor explained.

Tencost costs $495.

Decisionex, 1200 Post Road E., Westport, Conn. 06880.

■ **Assimilation, Inc. announced an interactive program that combines word processing with data base storage, manipulation and merge features for the Apple Computer, Inc. Macintosh.**

The program, known as Business Essentials, contains two modules: Autowriter and Data Merge.

Autowriter, the word processing component, is said to store words, names, sentences and paragraphs in the Macintosh for later insertion into standard correspondence forms.

The data base module, Data Merge, can list 600 items in 16 different fields for cross-referencing and manipulating data, the vendor said.

Business Essentials costs $79.

Assimilation, 485 Alberto Way, Los Gatos, Calif. 95030.

■ **Reference Software, Inc. offered software that lets IBM Personal Computer users access the Random House Dictionary and Random House Thesaurus.**

The package, called Reference Set, allows users to check the spelling of words, find synonyms and insert changes directly into text without having to exit programs or save files.

Macros are provided for storing words and phrases that a writer uses repeatedly and for entering these text strings with one keystroke.

Reference Set runs on the IBM Personal Computer, Personal Computer XT, AT and compatible computers. It requires IBM PC-DOS or Microsoft Corp. MS-DOS Version 2 or higher, 128K bytes of memory and either two floppy disk drives or a hard disk drive.

The software package costs $89. The dictionary and thesaurus are available separately for $69 each.

Reference Software, 2363 Boulevard Circle, Walnut Creek, Calif. 94595.

■ **Primavera Systems, Inc. has released Version 2.5 of its project management and control system, Primavera Project Planner, and Version 1.6 of Primavision, a compatible graphics plotter package. Both run on the IBM Personal Computer line.**

Version 2.5 of Primavera Project Planner provides screen graphics to view activity data in bar charts, resource and cost histograms and resource and cost profiles.

Users can produce graphics displays for all project activities or use the automatic sorting feature, Autosort, to look at only selected activities. Scrolling allows users to view a specific time period or group of activities, the vendor noted.

Continued on page 61

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Continued from page 60

Other project management system enhancements include free-float computation, reporting and sort/select, which allows an activity to be delayed without affecting the start of its successor.

In addition, a Generate command creates text files in the same format used to input records in Primavera's batch system. The command reportedly lets users break large networks into subnetworks by transferring files to a relational data base or report writer for further processing or by reentering files in the project manager for updating progress and performing "what-if" analyses.

Primavision Version 1.6 offers full match lining of multipage plots to produce images that span up to 10 sheets. Relationship lines on time-scaled logic diagrams can be suppressed to compress charts, according to the vendor.

Other upgrades include the ability to increase lettering sizes, thermometer bars for charting progress on a bar chart and network logic diagrams, the ability to save plots to user files and the ability to generate plots using start and end days and months.

Version 1.6 also adds support for Calcomp's 1040 and 1070 series plotters and other 907 Calcomp controller plotters.

Primavera Project Planner, at $2,500, and Primavision, at $1,500, run on the IBM Personal Computer, Personal Computer XT, AT and other compatible microcomputers. A minimum configuration is 512K bytes of memory, a hard disk and DOS 2 or higher, according to the vendor.

Primavera Systems, Suite 925, Two Bala Plaza, Bala Cynwyd, Pa. 19004.

■ **A sales/contact management system for the IBM Personal Computer, Personal Computer XT and compatible machines is available from Business Systems International, Inc.**

Called Salesbase/PC, the package is said to schedule follow-up actions, maintain a data base of contacts, create selected or mass mailings, forecast sales, record customer purchase histories, automatically dial contact phone numbers directly from the data base and create tutorial screens for on-line sales training.

The software also includes an on-line Help facility that can be accessed with one keystroke, the vendor noted.

System requirements are 256K bytes of memory, IBM's PC-DOS or Microsoft Corp.'s MS-DOS Version 2 or higher and a monochrome or color monitor. Salesbase/PC costs $895.

Business Systems International, 20942 Osborne St., Canoga Park, Calif. 91304.

■ **A word processing package that includes a 100,000-word dictionary, thesaurus, document indexer and word library for the Apple Computer, Inc. Macintosh computer is available from Rio Grande Software, Inc.**

Called RGS Wright+, the word processor is also said to provide a math module, graphics package, on-line Help facility, an undo function and the ability to merge data and charts into new and existing documents, the vendor claimed.

RGS Wright+ is compatible with Corvus Systems, Inc., Davong, Inc. and Tecmar, Inc. hard disk drives and interfaces with Apple's Macwrite and Macpaint. The software sells for $195.

Rio Grande Software, P.O. Box 5906, 221 Nolana, McAllen, Texas 78504.

■ **Fast Forward, Inc. has unveiled an electronic bulletin board with security, electronic mail and intercomputer file transfer capabilities for business users of the IBM Personal Computer.**

The electronic mail facility, known as Corporate Bulletin Board (CBB), includes an on-line text editor and is said to let users create public or private memos, certified mail, carbon copies and mailing lists. It reportedly allows the user to upload memos as files, edit and forward memos and keep confidential messages in private mailboxes.

CBB can transfer software programs, spreadsheets, word processing documents and data base files from one unit to another, including exchanging files between the Apple Computer, Inc. Macintosh and IBM Personal Computer. An Xmodem error-checking file transfer meth-

Continued on page 63

Introducing the TI 880 AT Printer. Because you need a multi-user printer that works overtime.

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MICROCOMPUTERS

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od gives 99.6% error-free transmission over noisy long-distance lines, the vendor claimed.

Data protection is provided by passwords and security levels. A call log records system activities, including security violations and incorrect passwords.

CBB runs on the IBM Personal Computer, Personal Computer XT, AT and compatible computers. The software supports IBM's Topview and Digital Research, Inc.'s Concurrent PC-DOS in both foreground and background modes, the vendor said.

A minimum configuration is 192K bytes of random-access memory, two floppy disk drives, a Hayes Microcomputer Products, Inc. Smartmodem, asynchronous communications card and communications software.

CBB sells for $495.

Fast Forward, P.O. Box 14706, Portland, Ore. 97214.

■ **Semantic Microsystems has announced Macscheme, an implementation of Lisp for the 512K-byte Apple Computer, Inc. Macintosh.**

Macscheme is said to conform to the standards for Scheme, a Lisp dialect, and to support such Common Lisp features as lexically scoped variables, first-class procedures, macros, generic arithmetic including floating-point and infinite precision integer arithmetic and the concept of continuations.

The software reportedly provides an interpreter with runtime error detection and debugging plus a Smalltalk-like interface that offers multiple scrolling windows.

Macscheme costs $125.

Semantic Microsystems, Suite 543, 1001 Bridgeway, Sausalito, Calif. 94965.

■ **Rochkind Software Corp. unwrapped Ride/DM, a version of the high-level business language Ride, that is said to let programmers develop multiuser data base applications for networked personal computers.**

Ride/DM works with The Database Machine, Cogent Data Technologies, Inc.'s board for the IBM Personal Computer, Personal Computer XT and AT, which acts as both file server and hard-disk controller for the network. The Database Machine gives networked micros simultaneous access to shared data files.

The software includes Ride programming features such as a screen forms manager and string processing. Ride/DM sells for $495.

Rochkind Software, 3080 Valmont Road, Boulder, Colo. 80301.

■ **Cubicomp Corp. has upgraded its Picturemaker three-dimensional design and animation software — which runs on the IBM Personal Computer — with additional imaging and motion scripting features.**

Imaging enhancements include texture mapping to superimpose two-dimensional images onto 3-D objects, shading to create reflective surfaces and the ability to generate transparent objects.

New motion scripting features include velocity profiling, which allows an animator to vary how fast an object accelerates in 3-D space, and metamorphosis, which smoothly transforms a 3-D shape into another.

Picturemaker costs $29,500.

Cubicomp, 3165 Adeline St., Berkeley, Calif. 94703.

■ **West End Film, Inc. has added antialiasing to its Artwork three-dimensional display list drawing software for the IBM Personal Computer and compatible computers.**

Antialiasing is a technique that is said to eliminate the jagged edges that appear in computer-generated images by ramping the edges on lines and planes of color to fade into the background and appear as a higher resolution image.

Antialiasing in Artwork requires the Number Nine Computer Co.'s Number Nine Revolution graphics card, the vendor said.

Artwork software costs $2,450.

West End Film, 2121 Newport Place N.W., Washington, D.C. 20037.

COMMUNICATIONS

■ **Gamma Productions, Inc. has announced the Gamma-Net 3.1 local-area network for the IBM Personal Computer line, based on the MIL-STD-1553 standard developed for digital data communications on board military aircraft.**

Gamma-Net 3.1 runs at 2M bit/sec. with a data throughput of up to 400K bit/sec., a spokesman said. The product supports IBM's PC-DOS 3.1 software and can service up to 255 nodes.

The network is installed using coaxial cable and an add-on controller card for each node. The card can be installed in an IBM Personal Computer, Personal Computer XT, AT and compatibles.

Features include collision avoidance and collision detection, error-checking on three levels and packet size varying from 4 bytes to 64K bytes. Cable segments can be as long as 1,500 ft of RG-58-type coaxial or up to 4,000 ft of RG-8-type coaxial without repeaters.

The Gamma-Net 3.1 local-area network is priced at $299.95 per node.

Gamma Productions, Suite 102, 817 10th St., Santa Monica, Calif. 90403.

■ **Softronics, Inc. has announced three versions of its Softerm PC terminal emulation software. The program now runs on the Texas Instruments, Inc. Professional computer, NEC Corp. Advanced Personal Com-**

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MICROCOMPUTERS

Continued from page 63

puter III and the Wang Laboratories, Inc. Professional Computer.

Softerm PC reportedly includes emulation capabilities for more than 30 terminals, including the Digital Equipment Corp. VT100 and VT220, IBM 3101, Data General Corp. D200 and D410 and the Televideo Systems, Inc. 925 and 950. The software also includes file transfer and utility functions.

The software requires a micro with a minimum of 256K bytes of memory, a monochrome or color monitor and Microsoft Corp. MS-DOS 2. The TI Professional computer version also requires an asynchronous communications controller card.

Each of the three versions is available for $195.

Softronics, Suite 203, 7730 N. Union Blvd., Colorado Springs, Colo. 80918.

■ **Systech Corp. has released a data communications processor for Intel Corp. Multibus-based microcomputers that was designed to provide serial interfaces with a wide range of standard and custom communications protocols.**

The four-channel DCP-8804 board is said to raise system throughput by off-loading communications-related functions from the main computer. It enables Multibus-based machines to operate in asynchronous, bisynchronous, Synchronous Data Link Control, High-level Data Link Control, X.25 and Systems Network Architecture communications protocols.

For OEMs, the company also provides AT&T Unix-compatible software drivers that enable the OEMs to adapt the DCP-8804 to their computers.

The DCP-8804 with 256K bytes of random-access memory costs $3,575. The X.25 optional software costs $7,000. Installation of an IBM 3780 emulation package costs $4,500, and the license fee for remote job entry software is $200.

Systech, 6465 Nancy Ridge Drive, San Diego, Calif. 92121.

■ **Avatar Technologies, Inc. has announced a hardware and software system that reportedly transfers files between the Apple Computer, Inc. Macintosh and a host IBM mainframe running CICS, TSO or CMS.**

Macmainframe was designed for use with Avatar's standard host file transfer software running on the mainframe. Macmainframe is said to give Macintosh users full IBM 3278 terminal emulation and either local or remote connection to the host, with dial-in capability for multiple users.

The hardware unit connects an IBM 3274 or 3276 control unit to the Macintosh modem port with coaxial cable. It reportedly provides an auxiliary RS-232 port with terminal pass-through capabilities for asynchronous communications.

The Macmainframe software reportedly operates in conjunction with Apple's Macterminal program, allowing file transfers to be set up in standard Macintosh format with the mouse or keyboard. Macmainframe is compatible with Avatar's Turbo series of IBM Personal Computer-to-mainframe links.

Macmainframe is priced at $1,295.

Avatar Technologies, 99 South St., Hopkinton, Mass. 01748.

■ **Gateway Communications, Inc. has announced Advanced Netware/G, a network operating system compatible with IBM's PC Network and PC-DOS 3.1 that reportedly supports up to eight file servers on a local-area network.**

Advanced Netware/G runs on Gateway's G/NET, a network that interconnects the IBM Personal Computer, Personal Computer XT, AT and compatible computers and is said to make G/NET compatible with the standard defined by Microsoft Corp.'s MS-NET and IBM's PC Network with PC-DOS 3.1.

Multiuser applications software running under PC-DOS 3.1 will reportedly operate unmodified in the Advanced Netware/G environment.

Features of the network operating system include electronic mail, remote workstation access, full-function printer spooling, system security and applications development support.

Advanced Netware/G is priced at $1,595. Each file server on a network requires a separate copy of the software. Netware/G users can upgrade to Advanced Netware/G for $295.

Gateway Communications, 16782 Red Hill Ave., Irvine, Calif. 92714.

■ **Grafpoint unveiled a Tektronix, Inc. 4107 graphics terminal emulation package that lets MS-DOS-based personal computers locally run mainframe graphics software and off-load graphics operations from a host.**

Called Tgraf-07, the software supports from 640- by 480-pixel to 1,024- by 1,024-pixel resolution boards, including the IBM Enhanced Graphics Adapter, the IBM Professional Graphics Adapter, the Verticom, Inc. M-16 and the TAT Galaxy series.

Additional boards supported include the 720- by 300-pixel resolution Texas Instruments, Inc. Professional and the 640- by 400-pixel resolution AT&T Personal Computer 6300, NEC Corp. APC III and Sperry Corp. Personal Computer.

Tgraf-07 is said to be compatible with such mainframe packages as Manufacturing & Consulting Services, Inc. Anvil-4000 three-dimensional computer-aided design system and United Computing Services, Inc.'s Ansys.

Tgraf-07 sells for $995.

Grafpoint, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

STORAGE

■ **Cipher Data Products, Inc. has introduced its Series 9000 system, a transportable ½-in. tape subsystem for use with the IBM Personal Computer line.**

Continued on page 66

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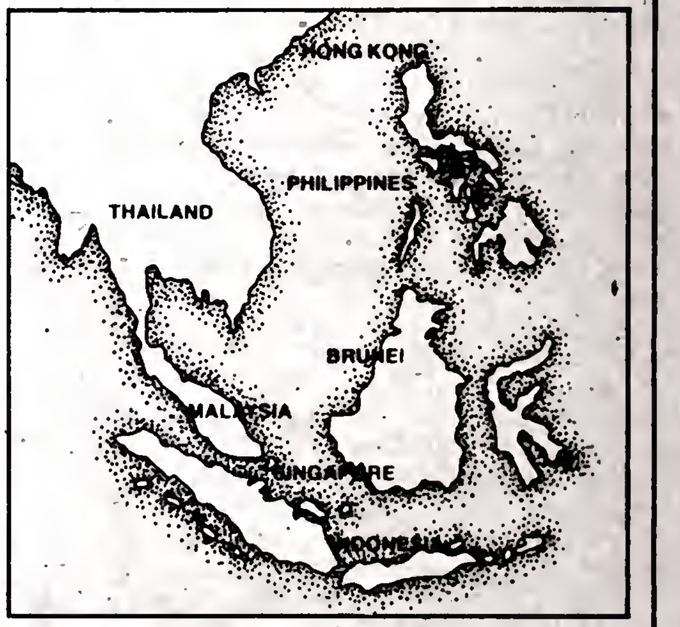

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So we approached Lattice, Inc. and asked if we could implement a version of the Lattice C compiler for IBM mainframes. With Lattice, Inc.'s agreement, development began and progressed rapidly.

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Our efforts are complete—we have a first-rate IBM 370 C compiler. And we are pleased to offer this development tool to you. Now you can write in a single language that is source code compatible with your IBM mainframe and your IBM PC. We have faithfully implemented not only the language, but also the supporting library and environment.

Features of the Lattice C compiler for the 370 include:

- **Generation of reentrant object code.** Reentrancy allows many users to share the same code. Reentrancy is not an easy feature to achieve on the 370, especially if you use non-constant external variables, but we did it.
- **Optimization of the generated code.** We know the 370 instruction set and the various 370 operating environments. We have over 100 staff years of assembler language systems experience on our development team.
- **Generated code executable in both 24-bit and 31-bit addressing modes.** You can run compiled programs above the 16 megabyte line in MVS/XA.
- **Generated code identical for OS and CMS operating systems.** You can move modules between MVS and CMS without even recompiling.
- **Complete libraries.** We have implemented all the library routines described by Kernighan and Ritchie (the informal C standard), and all the library routines supported by Lattice (except operating system dependent routines), plus extensions for dealing with 370 operating environments directly. Especially significant is our byte-addressable Unix®-style I/O access method.
- **Built-in functions.** Many of the traditional string handling functions are available as built-in functions, generating in-line machine code rather than function calls. Your call to move a string can result in just one MVC instruction rather than a function call and a loop.

In addition to mainframe software development, you can also use our new cross-compiler to develop PC software on your IBM mainframe. With our cross-compiler, you can compile Lattice C programs on your mainframe and generate object code ready to download to your PC.

With the cross-compiler, we also offer PLINK86™ and PLIB86™ by Phoenix Software Associates Ltd. The Phoenix link-editor and library management facility can bind several compiled programs on the mainframe and download immediately executable modules to your PC.

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We believe that the C language offers the SAS System the path to true portability and maintainability. And we believe that other companies will make similar strategic decisions about C. Already, C is taught in most college computer science curriculums, and is replacing older languages in many. And almost every computer introduced to the market now has a C compiler.

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Continued from page 64

The Series 9000 reportedly permits Personal Computers to read and write to either 10½- or 7-in. magnetic tape reels, as used on such larger systems as the Hewlett-Packard Co. 64000 mainframe.

The unit includes a controller card and a cabling and program diskette for use under the IBM PC-DOS 2 or later. The 9-track drive can read and write data in the IBM/Ansi-compatible, phase-encoded format at 1,600 bit/in., or 1,600/3,200 bit/in. in its dual mode.

The price of the Series 9000 ranges from $5,995 to $10,995.

Cipher Data Products, 10101 Old Grove Road, San Diego, Calif. 92138.

■ **Advanced Digital Information Corp. has introduced a ¼-in. cartridge tape storage system that reportedly offers general-purpose interface bus compatibility to data logging and automatic test equipment.**

The Model 570 Data Library, which connects to IBM's Personal Computer, Personal Computer AT and XT and compatibles, is said to provide 67M bytes of formatted user capacity. The data cartridges have permanent forward/reverse reading block keys that establish block locations.

The unit costs $3,900.

Advanced Digital Information, P.O. Box 2996, Redmond, Wash. 98073.

■ **Acknowledge, Inc. has introduced its AN-9800-PC 9-track magnetic tape subsystem for use with the IBM Personal Computer and Wang Laboratories, Inc. Professional Computer.**

The product reportedly permits file transfer between mainframes and personal computers by way of standard ½-in. tape.

Included with the AN-9800-PC reportedly are software utilities to allow conversion of Ebcdic mainframe files into the Ascii format used by personal computers.

It costs $4,995 for the IBM Personal Computer and $5,995 for a Wang-compatible unit.

Acknowledge, 10 Pennsylvania Ave., Framingham, Mass. 01701.

■ **National Memory Systems Corp. has introduced its NMS 01-OL 400M-byte laser optical memory system for use with the IBM Personal Computer line.**

The NMS 01-OL reportedly has a 15-msec access time and write-once capability. It stores 400M bytes of data on removable 5¼-in. media.

Also included in the unit are said to be a hard-disk storage unit, available in capacities ranging from 84M bytes to 335M bytes. The unit's host controller serves as interface and controller for both the hard disk and the laser disk.

The unit costs $15,900 with a 335M-byte hard disk.

National Memory Systems, 355 Earhart Way, Livermore, Calif. 94550.

■ **Genoa Systems Corp. has unwrapped internal and external 60M-byte cartridge streaming tape backup subsystems for IBM Personal Computer XT, AT and compatible computers.**

Model 3160 (internal) and 3260 (external) subsystems of the Galaxy line back up a 20M-byte hard disk in less than 4.3 minutes, according to a spokesman. Data transfer reportedly occurs at 86.37K byte/sec. at 90 in./sec. streaming mode speeds.

Features include multiple-window software, menu-driven commands, a context-sensitive on-line Help facility, an intelligent command line editor for editing entries without retyping and compatibility with local-area networks from 3Com Corp., Novell, Inc. and other vendors. An IBM PC-DOS toggle lets users run other applications or PC-DOS commands without exiting a Galaxy program in progress.

Reports are said to include partial or full directories plus tape utilization reports after backups.

The subsystems run under PC-DOS 2, 2.1, 3 and 3.1 and require 256K bytes of memory, a floppy disk drive to install the software, an 80-char. by 25-line color or monochrome display and two expansion card slots.

The system includes tape drive, interface card, cable, ¼-in. streaming tape cartridge, software in a 5¼-in. diskette and documentation.

Prices are $1,395 for the Model 3160 and $1,645 for the Model 3260.

Genoa Systems., 73 E. Trimble Road, San Jose, Calif. 95131.

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Micro vendors willing to deal

lar bullet for its net version of Word.

That introduction also represented another quiet sign of change, in that Microsoft Word for Networks is the supplier's first application specifically tailored for a local-area network. The debate about pricing of network software may be over before anyone notices.

There's some chance that the debate will be over before Lotus figures out its network policy. Lotus has been announcing plans to announce network plans for about a year now, so the current hints don't really send that delicious shiver of anticipation up and down the spine.

The 1-2-3 upgrade policy finally detailed earlier this month does show that Lotus is listening to its larger customers, who will get different pricing and other arrangements.

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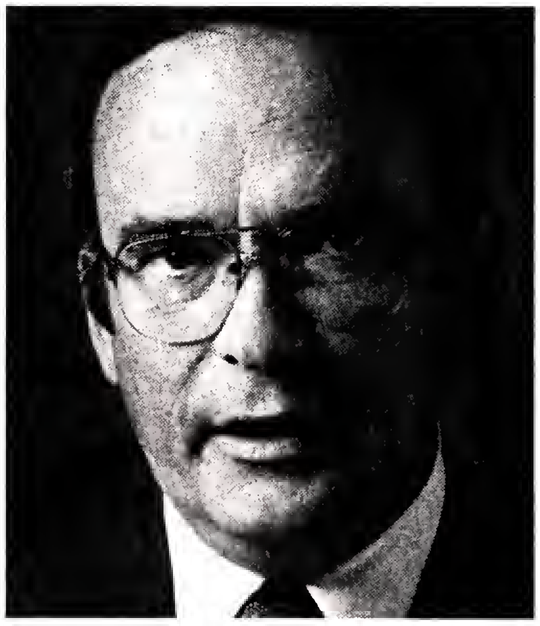

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COMMUNICATIONS

Communications tool for file transfer bows

By John Gallant

NATICK, Mass. — Software Research Corp. recently announced multivendor communications software that will allow processors from IBM, Digital Equipment Corp. and Wang Laboratories, Inc. to share files and messaging capabilities.

Software Research's Strategic Network Environment (SNE) Release 1.1 File Transfer Version 1. The first of a planned series of SNE products, the File Transfer software runs as an application under IBM's MVS or MVS/XA, DEC's VMS, Wang's VS, IBM's PC-DOS and Microsoft Corp.'s MS-DOS operating systems and supports messaging and a variety of file transfers between the diverse systems.

Using an IBM mainframe under MVS as a central or controlling node, a spokesman for Software Research said, SNE File Transfer allows users to link DEC's VAXs, Wang's VS minis and IBM's Personal Computers, Personal Computer XTs and compatibles as nodes off the mainframe. The software provides the file transfer and messaging capabilities between any two of the nodes.

SNE File Transfer supports text or binary data file structures including IBM's Vsam, Qsam, partitioned data set and generation data group; DEC's RMS; Wang's DMS; and PC-DOS and MS-DOS sequential files. In addition, the product performs any Ascii or Ebcdic data format conversions required to transfer supported files among different environments.

The spokesman said the product, dubbed a "universal file transfer network utility," allows users to assign symbolic

Continued on page 72

Peer-to-peer protocol debuts

By John Desmond

BERKELEY, Calif. — Orion Group, Inc. has announced the Orion SNA6.2 Peer Communications Facility, said to implement fully IBM's System Network Architecture (SNA) peer-to-peer communications protocols Logical Unit 6.2 (LU6.2) and Physical Unit 2.1.

The protocols enable microcomputers, minicomputers, mainframes, terminals, file servers and other devices to exchange information directly rather than going through a central host, the company said.

The networking facility was written in C under AT&T's Unix System V and was developed in conjunction with Apple Computer, Inc. The package requires no custom hardware and is being directed at OEMs and value-added resellers. Apple, the first licensed customer, is using the product to connect indirectly its Macintosh microcomputers with an IBM System/38, according to a spokesman.

Orion President Paul Rampel maintains his product is the first third-party product to offer full implementation of the IBM SNA 6.2 and 2.1 protocols, which many believe will become the industry standard for passing data between unlike computer systems. "These network protocols have been identified by IBM as a point of convergence for all its equipment, and no hardware vendor will be able to ignore it," he said. "Companies that implement the LU6.2 standard first will be way ahead of the game."

Rampel maintained that his product helps provide a missing capability of Unix System V — advanced networking capability. "We have a distinct advantage in the Unix marketplace," he said.

Continued on page 72

AT&T adds microwave bypass

Having once said it would not encourage users to bypass local telephone companies, AT&T has introduced two microwave bypass systems, an endorsement that will sap revenues from the former Bell operating companies.

The AT&T Network Distribution Systems product line includes a low- and high-end system. The low-end Network Distribution System Digital Radio 23 (DR23) is provided under a multimillion dollar private-label contract by Digital Microwave Corp. in Santa Clara, Calif. It is a 23-GHz digital microwave system that supports transmission rates from 1.54M to 6.312M bit/sec. for up to 10 miles.

At 6.312M bit/sec. — commonly referred to as T2 speeds — DR23 is said to be able to accommodate up to 96 digital voice channels, each operating at 64K bit/sec. The system's antenna can be installed on a roof or within an office, facing out a window.

Both the DR23 and its bigger brother, the DR6, provide point-to-point links for data or voice communications. The links can be used in common bypass applications, such as linking corporate facilities or linking a company directly to its long-distance communications carrier, thus eliminating the need for using the telephone company's local loops.

The high-end DR6, developed by AT&T Bell Laboratories and manufactured by AT&T's Network Systems Group, is a version of a system that AT&T has been selling to the divested Bell operating companies for their use or resale since August 1984. The system includes a 6-GHz digital microwave radio that transmits at 45M bit/sec., or T3 speeds, at distances up to 40 miles, supporting up to 672 voice channels at 64K bit/sec.

AT&T reported that it would provide in-

Continued on page 72

- Wang Laboratories announced the Wang Telephone Message Exchange, an operator-attended communications facility for telephone messaging and directory services/**72**

Few MIS execs manage both voice and data functions

Poll shows most firms expect no integration

By Paul Korzeniowski

The MIS manager who oversees both corporate data and voice communications functions represents the exception rather than the rule.

That was a finding from a *Computerworld* survey sent to a random sampling of subscribers in July. The 1,000 surveys were mailed with a dollar incentive, and 432 readers replied.

The survey found that in a slight majority of companies, separate departments manage voice and data communications (see chart). Few of the companies that manage the two functions with different departments plan to integrate the two functions (see chart).

As one may expect in companies where the two functions are split by department, the MIS manager rules data communications. Close to 85% of the companies listed data communications as the responsibility of the MIS department. Less than 2% said a communications department was responsible for data communications.

In the cases where voice and data functions were split, the department overseeing voice communications was less clearly defined. In 35% of these companies, the director of operations or administrative services supervised voice communications. Other titles mentioned were vice-president, assistant vice-president and telecommunications manager. In three out of four cases, these people worked in general administration.

Where voice and data functions are merged, two-thirds of the companies said the MIS department supervises both functions. In 20% of the cases, general administration oversees both functions.

Continued on page 70

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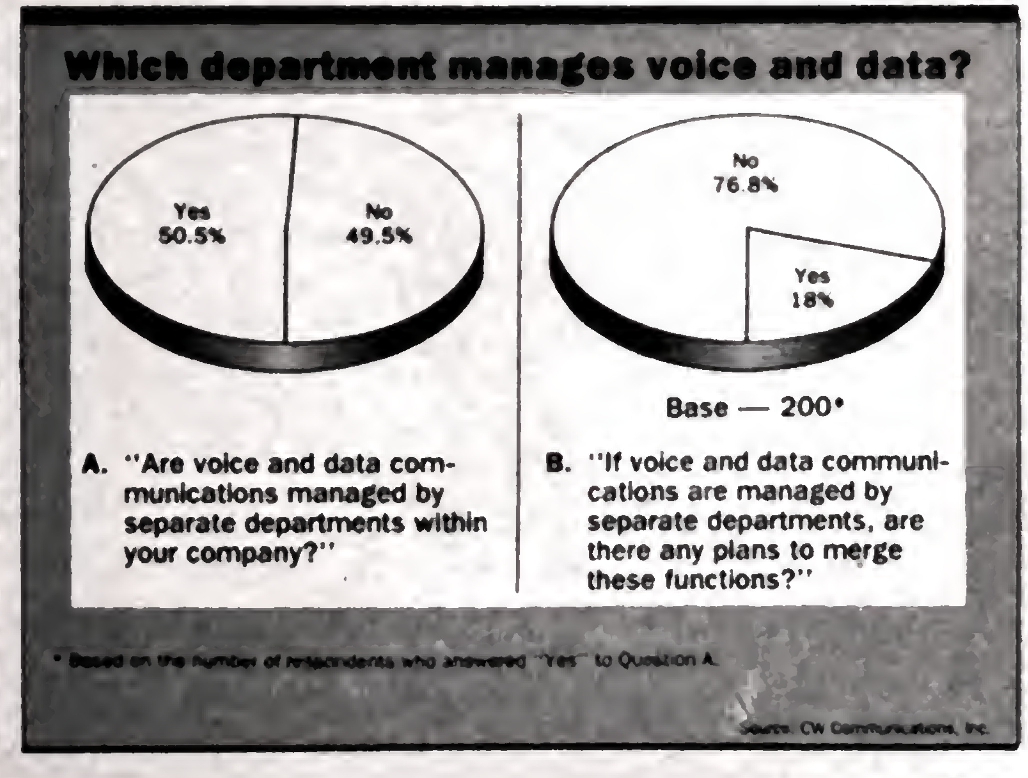
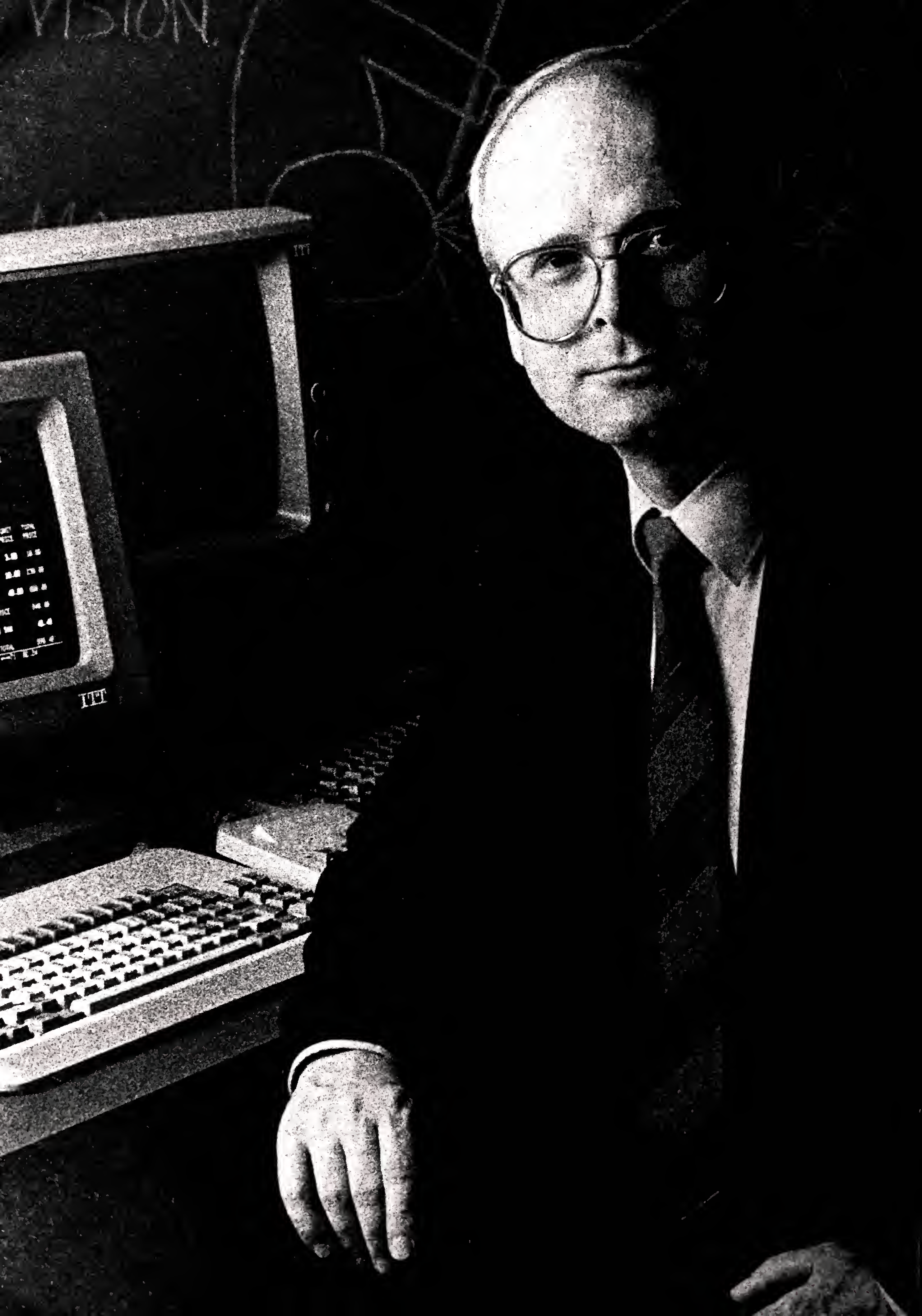


* Based on the number of respondents who answered "Yes" to Question A.

Source: CW Communications, Inc.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Where are MIS and communications on corporate totem poles?

	Percent of Total Answering Question
MIS/DP and communications are peer operations under a single executive.	35.3%
MIS/DP and communications are separate operations in separate groups.	30.5%
Communications is under MIS/DP.	29.8%
MIS/DP is under communications.	1.0%
Other	3.4%
Base	416

Source: CW Communications, Inc.

From page 67

Few executives manage both voice and data

Overall, only 30% of the companies surveyed said their MIS managers also oversee communications responsibilities (see chart). In 65% of the companies, MIS and communications are ruled by different groups. Of these companies, roughly half have communications and data processing as peer groups in the same department; the rest have MIS and communications reporting to different departments, with MIS typically reporting to finance and communications to general administration.

Interestingly, few companies reported they had a telecommunications director. Asked what the title of the person was that manages voice, more than 35% said director of operations/planning/administrative services. Only 12% said they had a telecommunications manager.

The survey also examined how local-area networks and private branch exchanges were used at these companies. These results will be printed in next week's *Computerworld.*

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From page 67

Peer-to-peer protocol debuts

Physical Units are used to describe types of devices used within an IBM SNA-type network. Equipment based on the Physical Unit 2 standard can only address IBM 370-based architecture in a hierarchical master/slave relationship. The Physical Unit 2.1 emulation enables peer-to-peer communications between a range of systems, including System/36 minicomputers and System/38 superminis, IBM 5520 Office Administration Systems, IBM Displaywriters and IBM Scanmasters.

Although Physical Unit 2 supports only a single communications link and one logical session per link, Physical Unit 2.1 can support up to 512 concurrent logical links, enabling that number of users to share the expense of a single physical cable.

"We don't think hardware, storage or the operating system are the constraints today. The constrained resource today is access to data," Rampel said. He noted that microcomputer board manufacturers can put the Orion software onto chips, and developers of local-area networks can use the facility as a gateway to connect two nets.

The principal advantage of LU6.2 is its accommodation of intelligent, low-cost network devices. "These days, data must be shared. The LU6.2 network design recognized this by permitting any device to talk directly to any other device without intervention."

The company offers its SNA6.2 Peer Communications Facility on a license and royalty basis.

Wang rolls out TMX facility

Wang Laboratories, Inc. of Lowell, Mass., has announced the Wang Telephone Message Exchange (TMX), an operator-attended communications facility for telephone messaging and directory services. The product features 24-hour telephone message retrieval without operator assistance.

With the Wang TMX, a telephone call is forwarded from a person's telephone to a Wang TMX Message Desk operator. The operator's workstation, a Wang Professional Computer linked to a Wang VS minicomputer supporting Wang Office Software, displays a personal profile created by the called party. The operator uses the profile to give a customized response and appropriate information, such as a relayed message or alternate contact.

The caller has the option of leaving an electronic message in the user's Wang Office mailbox, forwarding the call to a designated alternate or directing the call to the Wang DVX voice mail system for the caller to leave a personalized voice message.

The Wang TMX permits notification and retrieval of messages from any workstation in the Wang Office network. Wang Office messages can also be sent to a printer from a workstation or push-button telephone, according to the vendor.

The Wang TMX package consists of hardware and software for the Wang VS and Professional Computer. Hardware requirements include a VS with 2M bytes of main memory and a minimum of 147M bytes of disk storage, Wang Office software and a Wang Professional Computer with 640K bytes of memory.

The Wang TMX package will be available in the U.S. in the first quarter of 1986. The Professional Computer portion of Wang TMX costs $3,500 per workstation. The VS portion costs $500 per VS processor for a stand-alone system and $1,600 per VS processor when integrated with Centrex or the Meridian SL-1.

From page 67

Communications tool for file transfer bows

file names rather than learn specific vendor file naming and attribute conventions. It features interactive facilities for users to enter simple transfer requests and more complex sequences where request dependencies are required.

SNE File Transfer also allows a data processing professional to implement procedures in the product that automatically refresh file inventories within information center processors from production systems.

The system, which runs as an IBM Vtam application under MVS, supports IBM RACF security software and other Wang and DEC security systems.

The Software Research spokesman said that future releases in the SNE line will include electronic document interchange capabilities and support for IBM's VM, both of which are slated for release in the first quarter of 1986.

SNE File Transfer is currently available. The initial license fee is approximately $17,500 for an MVS host, $6,000 per minicomputer and $400 per personal computer.

From page 67

AT&T adds microwave bypass systems

dividual components, such as stand-alone radio products, or complete engineering, installation and maintenance. Options include local and remote alarms, centralized maintenance, hot standby protection, power options and signal encryption.

The Network Distribution Systems are custom priced and are available now from AT&T's Large Business Systems direct sales force. Prices for the simplest configuration start at $30,000.

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SYSTEMS & PERIPHERALS

SHOP TALK/BAO T. NGUYEN

DBMS vs. data base machine

Despite advances, the technology of software data base management systems still has problems. These problems include excessive overhead and limited performance. A software DBMS consumes a significant portion of the resources of a general-purpose computer.

Performance suffers when many users access data and when the information required from the system calls for data relationships different from those originally defined for the system. Although the relational DBMS is much easier to use than its Codasyl counterpart — reducing both initial program development costs and long-term maintenance costs — the flexibility of the relational DBMS is appreciably slower. This is due to a fundamental mismatch between the architecture of CPUs designed for the sequential execution of algorithms and the architecture required for data management. Data management is inherently a parallel activity.

In other words, the general-purpose processor is asked to do something it was not designed to do.

Data base machines attempt to overcome the deficiencies associated with conventional architecture by using a special-purpose, functional architecture designed to handle different functions of data management simultaneously. They are used as back-end machines, freeing the host computer to perform the functions for which it is better suited, and as data base servers in a collection of networked workstations or cluster minicomputers.

The data base machine is one of two major categories of data base processors. While the data base machine offers all DBMS functions, the I/O off-load processor, the other category, is limited to the physical retrieval of data. The I/O off-load processor system does not offer DBMS, data dictionary or nonprocedural facilities.

The data base machine places the data base management function on a separate processor with exclusive access to the data base. The host machine collects data management requests and transmits them across an inter-

Continued on page 82

Nguyen is a specialist in information systems technology and information movement and management for the U.S. Air Force assistant chief of staff for information systems.

Single-vendor service

MIS execs report growing interest in concept

LEXINGTON, Mass. — The single-vendor service concept, where one vendor maintains all of a customer's equipment regardless of the manufacturer, is of increasing interest among management information systems directors, according to the Ledgeway Group, a market research and consulting firm.

In a recent telephone and mail survey of MIS directors in Fortune 1,000 firms, Ledgeway found a growing interest in having a primary vendor maintain other vendors' products, according to Ledgeway managing director Richard C. Munn. Ledgeway noted that 46% of the surveyed MIS directors indicated that they might be interested in the single-vendor concept. That 46% figure was obtained by combining the 15% who said, "yes" they would consider single-vendor service, and the 31% who answered "maybe" to the same question.

Munn said the most common benefits cited in connection with single-vendor service were elimination of finger-pointing among vendors and better coordination of diagnoses and repairs.

In addition to increasing interest among customers, the single-vendor service concept is gaining popularity among vendors, according to Munn. Among those vendors, the idea receiving "considerable attention" is that of having a single vendor act as the customer's service manager. Munn said that in such a role, the single vendor is responsible for fault diagnosis and isolation, repairing or managing a subcontractor making the repair and areas such as service contract administration.

But Munn noted that the service-manager concept is less popular with customers who prefer having their primary vendor service all equipment.

He also cited two surprising findings of focus groups conducted in conjunction with the survey. Those groups, one with customers and another with district and branch service managers, re-

Continued on page 81

Off-site storage protects data

HARD TALK
Donna Raimondi
CW Staff

Information is as important a resource as labor, capital and raw materials. As users begin to accept the need to protect their data, they would be wise to investigate storing copies of their magnetic media in safe places.

That is the advice given by Reginald Weller, president of National Safe Depository in San Jose, Calif., in a paper titled "Off-Site Data Storage: A Changing Industry."

Although Weller is president of a storage company and, therefore, has a vested interest in how people store their information off site, it is worth looking at his views. Too many companies still trust the Fates to keep their data safe and feel that they need not participate in disaster planning.

Information is one of the most fragile, volatile and easily destroyed of all corporate assets, and yet it is among the easiest of resources to preserve. Management can quickly calculate the cost of hardware and software, but few can state the value of their data base.

A key element in disaster planning and management should be an off-site storage program for one — or preferably two — sets of duplicate backup records, Weller advised. Off-site storage costs less than on-site storage, he said. He pointed out that the average storage account costs $200 to $300 per month, while a single in-house security guard could cost $1,800 per month.

The odds of a company's data base being destroyed decrease dramatically if the data base is stored in two or three locations, the paper said. One common yardstick for how far off site that storage should be is that data should be retrievable in two to four hours. This criterion varies from company to company, but most companies

Continued on page 81

■ Free exchange of information between systems is the key to true computer-integrated manufacturing/**79**

■ Honeywell Information Systems will offer Storage Technology tape drives on its mainframe products/**82**

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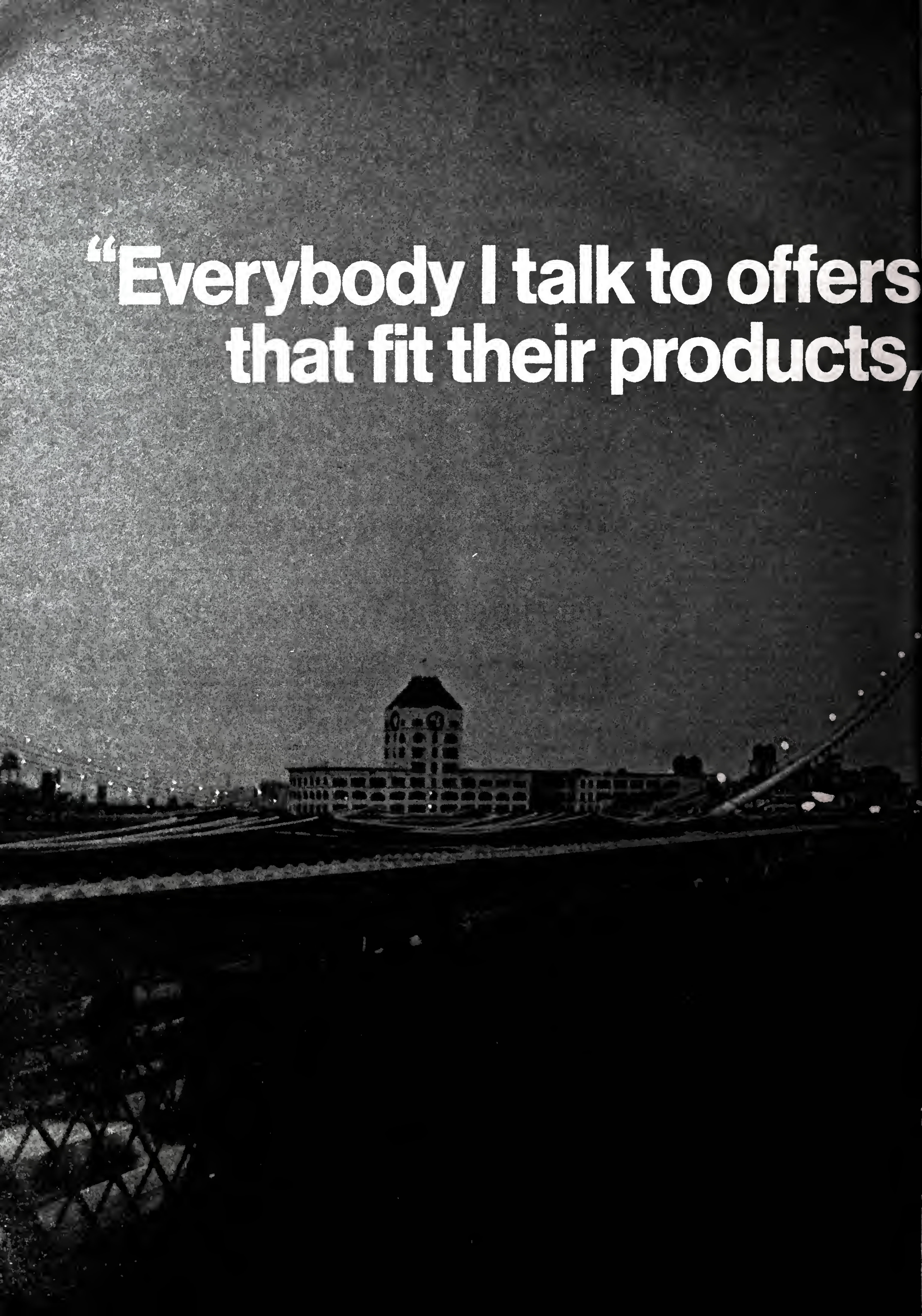
* Based on room inventory of Hilton Hotel Corp., which does business in the U.S.A. Source: New York Times article, week of 4/1/85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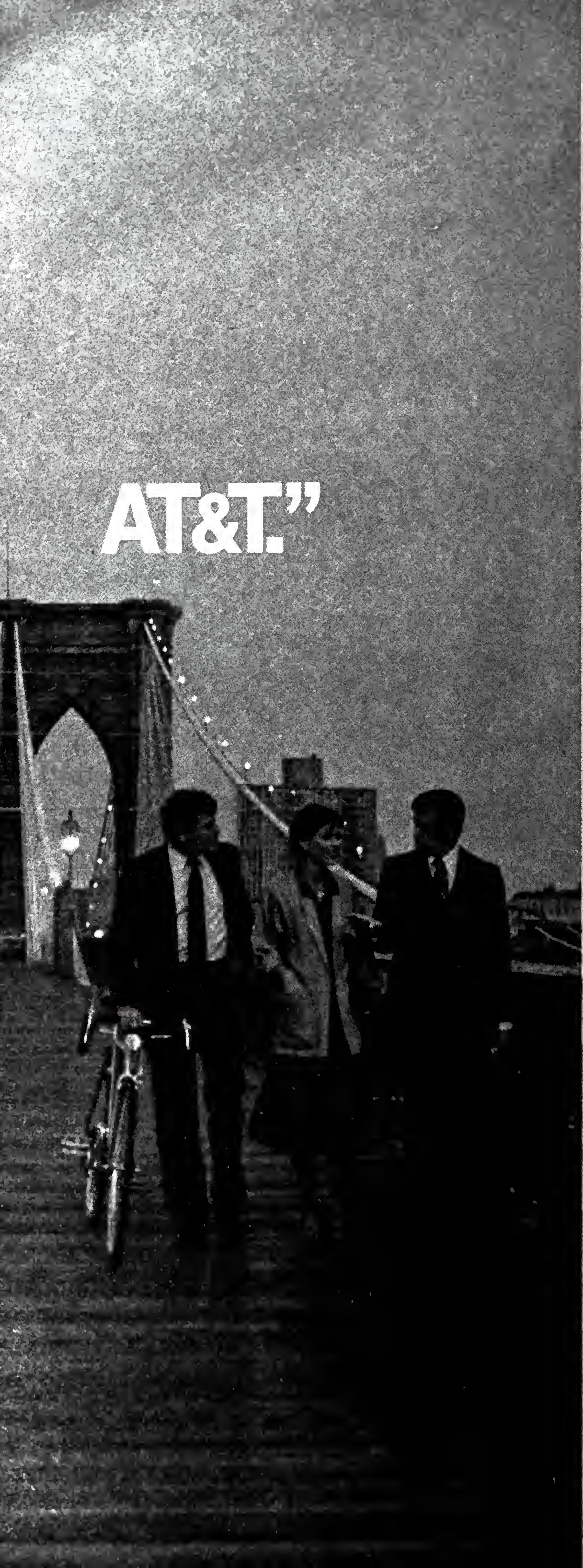
solutions
instead of my needs.”
“Better talk to



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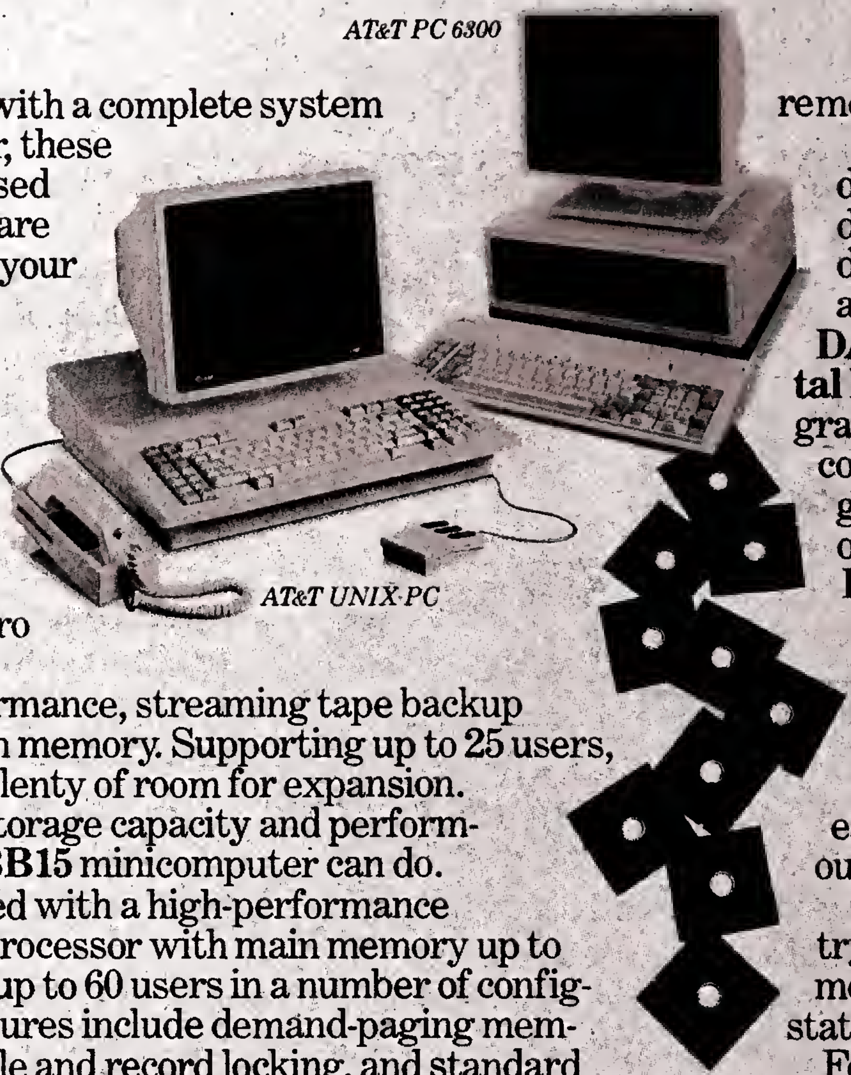
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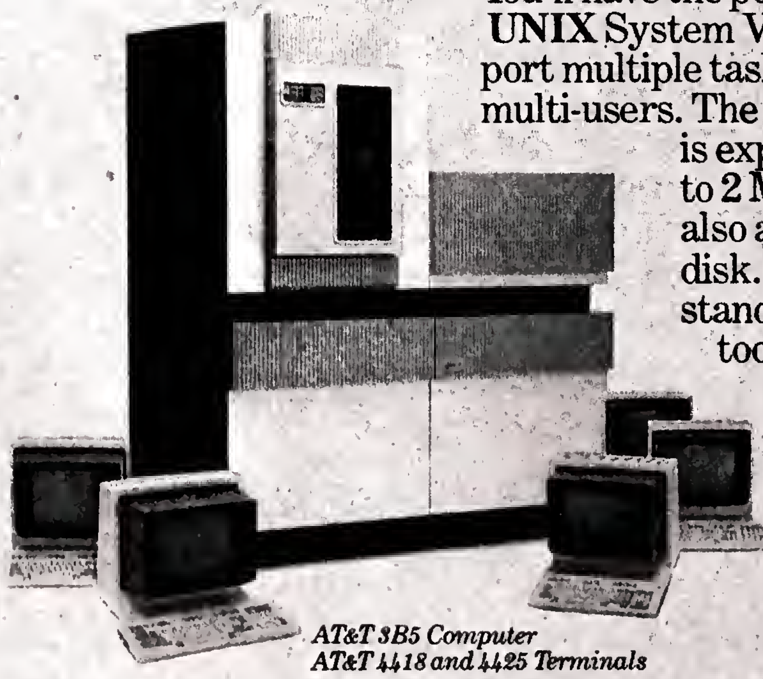
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AT&T E4540 Terminal
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The right choice.

True CIM hinges on information link between systems

By Sheila L. Cotter
and Charles S. Skinner
Special to CW‡

True computer-integrated manufacturing (CIM) will not become a reality until manufacturers can freely exchange detailed product, manufacturing and other information among a variety of systems, be they computer-aided engineering (CAE), design and manufacturing or others.

For example, product data is needed to perform numerous manufacturing tasks such as numerical control equipment programming, process planning, tool design, production planning and control, quality control and assurance and the like. Similarly, manufacturing data is required by the engineering/design function to achieve cost-effective products.

The information link between CAD, CAE and CAM systems, unless on a system purchased from a single supplier, is still maintained largely with paper documentation using engineering drawings. This method requires a great deal of product definition interpretation. Automating this link requires a common product description that must be characterized by the following:

- Complete from a manufacturing as well as a design perspective.
- Usable by all the applications that need product data.
- Understandable by both people and the computer.

Issues to resolve

Even though the CAD marketplace is substantial, growing and includes some powerful key players, it has some fundamental issues to resolve:

- Failure to capture all product definition data needed for manufacturing and other functions of the enterprise.
- Inconsistent product information formats.
- Lack of compatibility of CAD equipment and software supplied by a variety of manufacturers.

Risks involved

Committing to a single supplier for one's CAD/CAM systems to acheive compatibility and integration is fraught with risks:

- The supplier may not continue to offer the most cost-effective systems available.
- Systems from a variety of suppliers may be required to meet a broad array of needs by numerous units of the enterprise.
- Compatibility of multisupplier CAD and CAM systems is required for the enterprise to interact effectively with customers and vendors.

Taking CAD systems as a case in point, communications between dissimilar systems are made possible through compatible networking and a common language like Iges.

Booz, Allen & Hamilton, Inc. conducted a nine-month study to test 12 different vendor and user-developed Iges translators to determine the degree of compatibility between dissimilar CAD systems and thus the quality and level of implementation of the Iges standard.

The effort was performed under McDonnel Douglas Automation Co.'s Product Definition Data Interface project funded by the U.S. Air Force.

Based on these tests, which did not exhaustively examine every aspect of Iges but did provide an in-depth evaluation of its implementation, problems were found with both Iges itself and with the translators developed by the suppliers and users. At the time of the tests, no participant had completely implemented an Iges Version 1 pre- and postprocessor. There was wide and generally successful implementation of wire-frame geometry and annotation, but not of sur-

Continued on page 81

Cotter is an associate, and Skinner is vice-president for Booz, Allen & Hamilton, Inc. of Cleveland.

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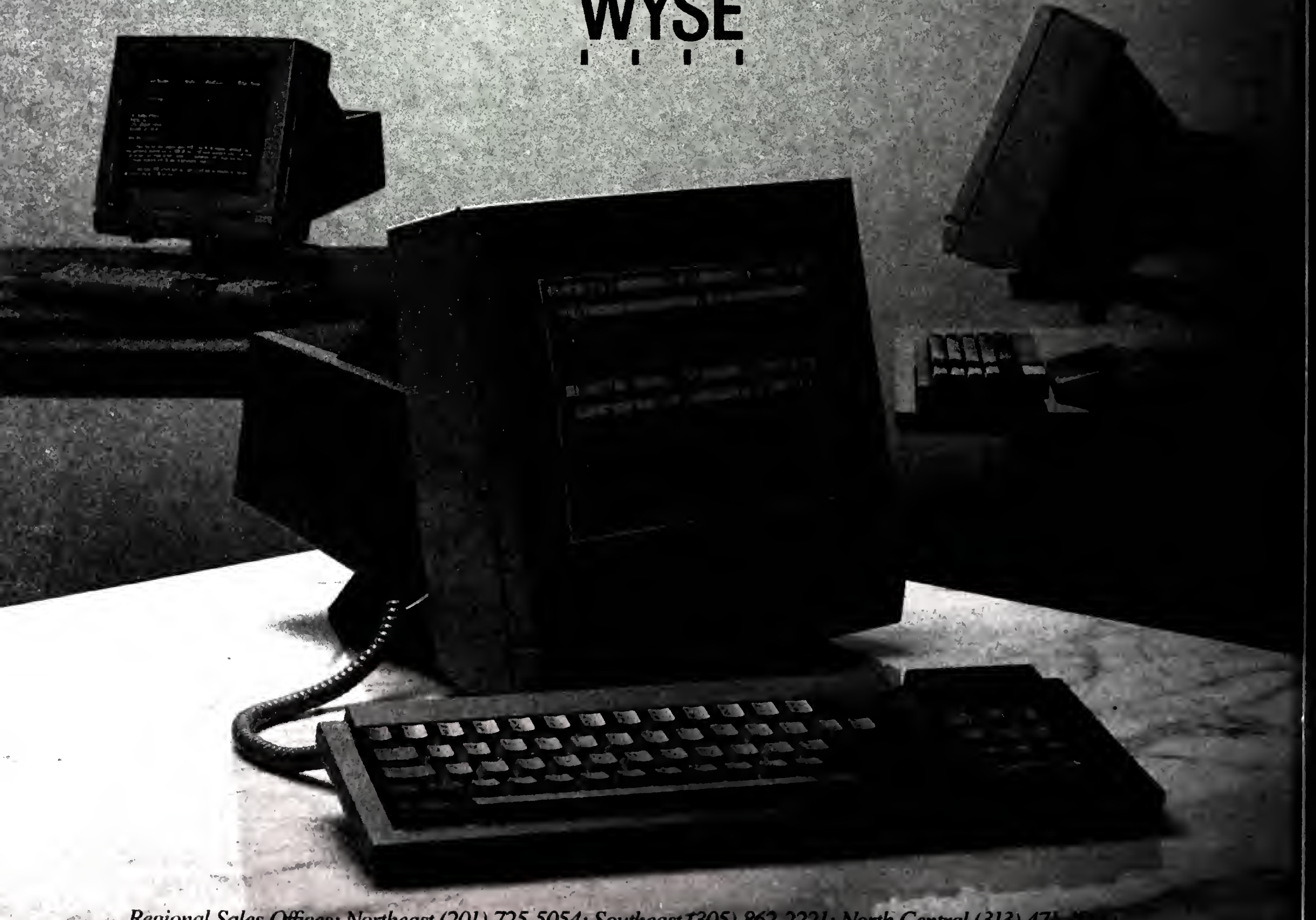

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From page 73

Off-site storage protects information

want access as quickly as possible.

According to Weller, storage customers should be aware that if data is stored in an on-site vault, the vault may remain intact in case of a fire, but the contents could be destroyed by heat. Buildings that have suffered fire, flood, earthquake, smoke or toxic gas damage are sometimes closed by health or fire authorities for several days — or even weeks — after a disaster, Weller said.

Del Monte's experience

That was the case with Del Monte Corp. in May 1983. The $3 billion food processing and distribution company's users were completely cut off from their main computer system for eight days that month when a transformer blew, leaving the systems intact but also leaving the threat of chemical contamination that made health authorities close the building.

The threat of damage by a company's employees should also be considered, according to Weller. Human-caused catastrophes include vandalism, arson, riots, strikes, sabotage, accidents, oversights and human error.

A company should undertake a careful risk analysis that identifies and measures the economic impact of various risks, Weller said. Management should ask itself the following questions:

- What will it cost if certain data is lost?
- How long can the company be closed, in whole or in part, without threatening its ability to survive?

Records should be classified by order of their importance to the company, Weller said. Critical data should receive off-site storage backup.

Noncritical data — data that can be regenerated if needed at a cost that is less than off-site storage costs — can be backed up on site in a way that keeps it protected as much as possible.

In selecting a backup site, companies should do the following:

- Visit all available sites within a chosen area, eliminating storage companies that will not allow a tour of their facilities.
- Check out the site for fire protection, climate control protection, access and delivery services.
- Meet the people who run the business and make sure you are comfortable with them.
- Obtain references from present customers.

From page 73

Single-vendor service concept growing in MIS

vealed that there is a degree of skepticism of single-vendor service and a feeling that the operations staff may be threatened by such coverage. The groups also showed that there is "considerable cooperation between service personnel representing different vendors at the local level."

Munn theorized that that cooperation stems from the service representatives' allegience to their craft and a desire to avoid wasted time.

Munn noted that companies including AT&T Information Systems, Control Data Corp. and Digital Equipment Corp. have introduced single-vendor service and that other companies are offering such service on an ad hoc basis.

"This is a very difficult service to offer successfully, and there are a number of risks for any service vendor considering these concepts. At the same time there are opportunities to expand the range of services offered and certainly help gain more control over an account. As vendors expand and promote these services, there will be much greater competition for third-party service companies, and many smaller vendors will be relegated to subcontractor roles," Munn said.

The study, "Service in a Mixed Vendor Environment," and videotapes of the focus groups is priced at $2,750.

From page 79

True CIM relies on data link between systems

faces and structure. Most were generally successful in dealing with the Iges format and translating the test cases.

Even though most of the identified problems were specific to certain sites, there were some generic Iges issues that required future resolution.

Wire-frame, two-dimensional and three-dimensional geometry has been successfully implemented because it is similar to and adequately replaces engineering drawing product design information. As a result, many CAD users are content with this well-developed aspect of Iges, thus minimizing the pressure on suppliers to develop more difficult surface representations.

Furthermore, Iges is not truly neutral in that it was based on early commercial CAD systems representations. Systems substantially different from Iges have greater difficulty processing some Iges entities.

Several development needs were identified from this survey that are key to achieving CIM. Many boundary representation solids are still approximations not suitable for numerical control programming because of product precision requirements.

There is a clear need for greater integration of shape and nonshape data structures and a definition of manufacturing data in computer-understandable form. Part features need to be defined. And, finally, product definition data formats need enhancement, and a single format needs to be agreed upon as an international standard.

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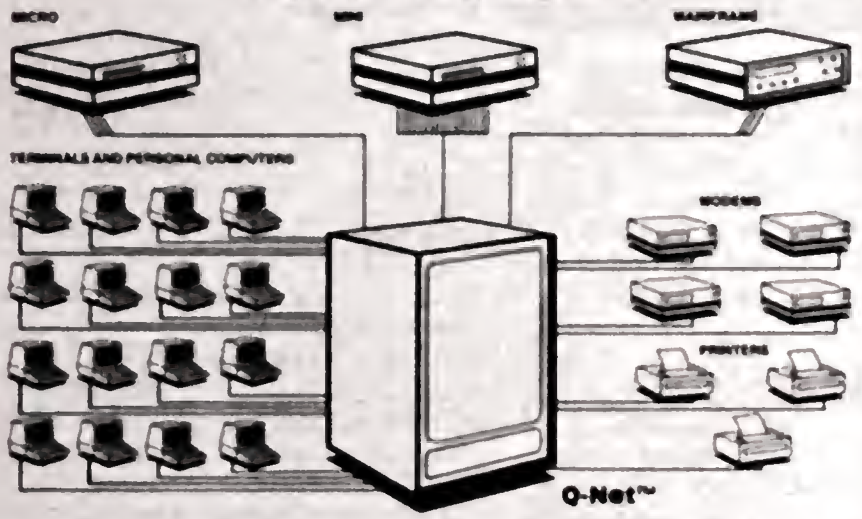

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From page 73

DBMS vs. data base machine

face to the data base machine. Status and results are accepted from the data base machine by the host and sent to the appropriate application programs.

The more a data base machine does in off-loading work from the host computer the better. However, there is a limit. The host machine should handle query translation, end-user facilities support, terminal communications, scheduling, formatting of user output data, system integrity and security and application logic.

The benefits of using a data base machine include the following:

- Host independence. A data base machine can interface with a wide range of machines.
- Flexibility. When expansion or upgrading is needed, the data base machine is more economical than the next larger computer.
- Performance. The architecture was designed to perform only data base management functions, so data base machines can perform data base operations much more quickly than a host computer can, and less powerful hosts can support required levels of response.
- Shared data base. Many different computers can share the same data base.
- Off-load host or isolation of DBMS overhead. Data management requires large programs and consumes a large percentage of a host computer's capacity. Moving the work into a data base machine frees the host to perform other tasks.
- Reduced cost. Data base machines cost substantially less than the hosts they off-load. Also, the intangible costs of a computer system's resources must be added to the tangible costs of a software DBMS, while the data base machine can support multiple hosts without duplicating peripheral equipment.
- Efficiently supported relational models. Relational data bases are powerful and flexible but are slow performers and heavy users of computer resources. Data base machines can efficiently support the relational model.
- Security. Data base machines provide a second level of security control.
- Speed. The processing speed of data base machines is limited only by the speed of the secondary memory.
- Central control. In a net environment, the data base machine provides a central data management facility. Several computers can share access to data stored on the data base machine because concurrency control and protection functions are implemented within the machine.
- Improved recoverability. As the data base management functions are separated from the host, the recovery of these functions becomes feasible without impacting the system.
- Modularity. The separation of functions enhances the concept of modularity through the system and translates to future growth by data base sharing through multiple machines.

In some cases a host processor must be connected to multiple data base servers, and, since many installations already have host processors interconnected on a local-area network, the data base machine should be connected in this environment.

To accomplish this, local network hardware must be standardized, since data base machine designers and manufacturers cannot afford to offer interfaces for more than a limited number of network types. Fortunately the Institute of Electrical and Electronics Engineers, Inc. is making progress in local-area network standardization.

The second level of standardization requires standardization of the communications protocol used by the host processors to communicate with the data base machine over the local-area network. For the U.S. Department of Defense, even with TCP/IP as a base, a higher level protocol — an application protocol — will be needed for standardization.

Specifications, development and adoption of such protocols by data base machine vendors will provide tremendous flexibility in purchasing and using data base machines.

There are several data base machines now, or soon to be, in production. These include the following:

- The Teradata Corp. DBC/1012.
- The Valence data base machine being built by Ordain, Inc.
- The IDM-500, built by Britton-Lee, Inc.
- Data base machines being built in other countries. There are two projects in France, two in Japan, one in West Germany, one in Italy and one in the UK.

STC to supply tape subsystem to Honeywell

In a $15 million multiyear OEM agreement, Storage Technology Corp. (STC) of Louisville, Colo., has contracted to supply tape subsystems to Honeywell Information Systems, Inc.'s Large Computer Products Division of Phoenix.

Under the agreement, STC will supply Honeywell with its 4600 series Fips tapes subsystems, a 200 in./sec. dual-density 1.6K and 6.3K bit/in. recording formats. Introduced in 1983, the 4670 features an optional 3M byte/sec. throughput rate.

A Honeywell official said the tape subsystems will be available in early 1986 with Honeywell's DPS 8, DPS 88 and DPS 90 systems.

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COMPUTER INDUSTRY

Giants not ready for war

By Paul Korzeniowski

NEW YORK — Before AT&T and IBM can begin to compete directly, both must overcome challenges evident in the traditional markets each has dominated.

Archie McGill, who served in executive positions at both companies and is now president of Rothschild Ventures, Inc., a New York investment firm, made that claim recently at "IBM — AT&T, New Technologies, New Directions," a seminar sponsored by the New York-based market research firm, Eastern Management Group.

Even if both companies do make the necessary moves, head-to-head competition will not take place until 1990, he said, adding that analysts have underestimated how much effort is needed for either company to forge a presence in the other's market.

A primary challenge that IBM faces is that mainframe sales have peaked and are now the slowest growth area in the industry. "I expect that the 3090 series announcement will increase IBM's mainframe sales, but sales will not grow more than 7% a year," he said.

Users are confused by changes in the industry and are looking to companies like IBM for answers, but the big companies have failed to deliver on promises, he said, citing IBM's yet-to-be-introduced local-area network.

Many analysts have praised the purchase of Rolm Corp., but McGill claimed that IBM will have problems digesting the communications company. "IBM will need a few years before it realizes a profit from that acquisition," he claimed.

Rather than purchasing companies, McGill predicted, Big Blue will enter more joint marketing agreements like those inked with MCI Communications Corp., Stratus Computer, Inc. and Bytex Corp. "Not even IBM has the breadth to compete with all companies on all fronts," he noted.

AT&T, on the other hand, faces the most complex and complicated challenge in the history of American business, according to McGill. "The company has to change revenue and profit streams that have existed for more than 100 years," he explained.

Compounding the problem is that every one of AT&T's revenue streams is under pressure. The

Continued on page 87

'Fit' vital in buy-outs

Acquisitions should complement strategy

By Clinton Wilder

NEW YORK — The most successful corporate acquisitions are motivated by strategic rather than financial considerations, according to an executive of one of the most active corporate buyers of software and services firms during the last five years.

Peter Lessler, director of acquisitions for Dun & Bradstreet Corp., told a recent industry forum that regardless of how attractive the cost of a potential purchase may be, financial issues should only be considered after measuring the strategic fit of the buyout candidate.

"Understand the dynamics of the market you're thinking about entering — who's gaining market share, who's losing and the position of the acquisition candidate," Lessler said at the Association of Data Processing Service Organization, Inc.'s (Adapso) annual seminar on mergers and acquisitions activity in software and DP services. "The company to be acquired must fit the acquirer's profile in marketing, product direction, operations and, most difficult to assess but perhaps most importantly, in management characteristics."

Lessler noted that Dun & Bradstreet, after making 33 acquisitions during an 18-month shopping spree, including McCormack & Dodge Corp., is now trying to build on its existing businesses rather than continuing to diversify.

Considerations to assess the proper fit, Lessler said, include the current and potential product and geographical overlap in marketing and the potential for sharing technological resources. In market position, the most likely software and services acquisition candidates have small to medium

Continued on page 92

Global-Ultimacc looks ahead

By Peter Bartolik

The management team at Global-Ultimacc Systems, Inc. gained a new lease on life recently when the U.S. Bankruptcy Court in Denver approved the sale of Storage Technology Corp.'s (STC) majority ownership in the firm.

Charles J. Siefert, chairman of Waldwick, N.J.-based Global-Ultimacc and one of the five company executives who bought out STC, said in a phone interview that he expects Global-Ultimacc to regain profitability by the end of the year.

"The major change, and we've already seen it happen, is the perception in the marketplace," he said. "Customers are no longer concerned about us being pulled into bankruptcy; technically, STC could have done it any time. All they had to do was call their debt."

Global-Ultimacc absorbed the customer base and field engineering force of bankrupt Magnuson Computer Systems, Inc. and markets IBM 4300 plug-compatible systems and turnkey systems. Siefert said the company hopes within weeks to be able to announce an OEM agreement providing a next-generation processor but said he could not provide details until the deal is finalized.

After watching revenue almost double in 1984 to $29 million, the company was essentially left out in the cold when STC filed for reorganization protection last winter. The situation was critical because Global-Ultimacc depended exclusively on STC for most

Continued on page 92

- Tandon finally lost a round to a foreign disk drive manufacturer before the International Trade Commission, but the company said that skirmish was moot and looked ahead to a pending antitrust action/**85**
- Digital Switch was awarded a major contract by one of the first Japanese companies to go into competition with the Nippon Telegraph and Telephone giant/**91**
- Posting its first operating loss in 10 years, Advanced Micro Devices said it will try and spark the depressed chip market by introducing a product each week beginning in October/**91**

Adapso winning Pyhrric victories?

INDUSTRY INSIGHT
Peter Bartolik
News Director

Let's face it, sometimes industry lobbying groups get carried away with the thrill of victory and neglect to consider the seeds of discontent that could someday lead to the agony of defeat.

A case in point — the Association of Data Processing Service Organizations, Inc. (Adapso) in the latest issue of its newsletter, "Adapso Data," begins with the headline "Adapso victorious on California warranty bill."

The text thereunder went on in more humble terms to explain that "due in large part to Adapso's coordinated opposition," a California Assembly committee suspended any action on AB 1507. That bill, for those who haven't been following the revolutionary actions of its sponsor, Assemblywoman Gloria Molina, would have, Adapso explained, "dramatically changed the relationship between buyers and sellers of computer hardware and software by prohibiting the disclaimer of implied warranties while requiring developers to provide a refund or replacement if a product did not meet users' expectations."

Perish the thought that the seller of a product should be required to actually deliver on his promises!

Here's a typical disclaimer, taken from a Microsoft Corp. package, of the type that Adapso is so committed to preserving: "The program is provided 'as is' without warranty of any kind. The entire risk as to the results and performance of the program is assumed by you. *Should the program prove defective, you (and not Microsoft or its dealers) assume the entire cost of all necessary servicing, repair or correction* [emphasis added]. Further, Microsoft does not warrant, guarantee or make any representations regarding the use of or the results of the use of the program in terms of correctness, accuracy,

Continued on page 93

Major lessors shun Comlease

By Maura McEnaney

NEW YORK — During a year of waning trade show attendance, a group is venturing into untested waters, launching what it claims to be the first trade show on computer leasing.

But like many of the shows this year, next week's Computer Leasing Conference and Exhibition (Comlease) seems to hitting a period of vendor apathy. Some familiar names, such as Citicorp Industrial Credit, Inc., Greyhound Capital Corp. and World Leasing Co. will be present. But Comlease will debut without the participation of several leasing giants, including IBM Credit Corp.; Comdisco, Inc.; Dataserv Equipment, Inc.; and CMI Corp.

Show manager Ken Burroughs told *Computerworld* approximately 20 exhibitors have accepted booth space at the show, scheduled for Sept. 30 to Oct. 2, at the Marquis Hotel here.

An IBM Credit spokesman said Big Blue received information about Comlease after the com-

Continued on page 92

Contracts key for clarifying software owner's rights

FOURTH IN A SERIES

**By Jerome J. Roberts,
Marianne D. Paine
and Michael P. Brownell**
Special to CW‡

A contract provides two indispensable elements in any software protection plan: It implements and amplifies the rights and duties arising from intellectual property law; it also provides a mechanism to create additional rights and duties, enabling the software owner to protect elements of software products not otherwise protected by intellectual property law.

Contract protection provides the glue to bring together all available protective tools into a comprehensive and cohesive proprietary protection plan.

Contract protection of software should be in writing, preferably signed by both parties. Written contracts should be used for any transaction involving the disclosure or development of proprietary software such as software licensing, software development projects, marketing and distribution arrangements, beta test site situations and employment and independent consultant relationships. Confidentiality agreements of a general nature can be utilized for miscellaneous circumstances in which proprietary information is to be disclosed.

The presence of a written agreement does not automatically ensure adequate contract protection of the relevant software proprietary interest. Often, unfortunately, such contracts fail to allocate the parties' respective rights and duties relative to important proprietary rights issues. Without contractual guidance, such issues will be resolved by statutory and/or common law principles, often yielding uncertain, unexpected and undesirable results.

Each software-related contract will present certain proprietary rights issues specific to it. Consequently, specific contractual measures necessary to protect software require a case-by-case analysis. The following, however, are some of the topics that should be addressed:

■ Proprietary materials should be defined as completely as possible. Such definitions often address the following considerations: the type of software element, for example, programs, documentation or report formats; medium of expression, for example, source code, object code, microcode; media on which the software resides; and accompanying manuals and other documentation.

The definition should extend to all copies of the software and related materials made by the recipient, as well as to all software modifications furnished by the owner — and possibly created by the recipient. Finally, the applicable proprietary rights existing in and arising from the software and related materials should be recited.

■ The respective rights and interests of the parties in the proprietary materials to be disclosed and/or created must be delineated carefully. In a software license, the

Continued on page 85

Roberts, Paine and Brownell are attorneys with the law firm of Berman, Roberts and Kelly in Chicago. The firm's practice deals with legal issues related to procurement, development, distribution, management and protection of computer resources.

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From page 84

Contracts key in software mart

owner should reserve ownership and require the licensee to acknowledge the same. The issue of ownership may be a subject of debate in contracts calling for software development. In employment agreements, the employer should retain ownership of materials created by the employee in the course of his employment.

- The purposes for which the recipient is permitted to use the software must be defined clearly, and measures used to protect the owner's interests in the software should be specified. Restrictions on use, copying and disclosure of the software may be in order.

Examples particularly appropriate for the software license include the following: Use of the software should be limited to those activities reasonably related to the purpose of disclosure; if copying is permitted, it must be limited to specific purposes and quantities, and all copies should contain the proprietary legends appearing on the original software or as otherwise directed by the owner; and the recipient should notify the owner upon suspicion of misuse.

- A provision should be inserted that requires the recipient to return or destroy the software upon the termination or expiration of the purpose of disclosure.
- The recipient is often required to indemnify the owner against any loss or expense incurred as a result of the recipient's failure to comply with its proprietary protection obligations.
- The agreement should state that the recipient's proprietary obligations survive termination or expiration of the agreement for a specified time period or until the software ceases to be proprietary to the owner.

ITC drops Tandon's trade suit

WASHINGTON, D.C. — The U.S. International Trade Commission (ITC) recently dismissed Tandon Corp.'s unfair trade practices suit against South Korean disk drive manufacturer Gold Star Tele-Electric Co

The ITC refused to bar imports of Gold Star disk drives, upholding a previous judge's ruling that Gold Star did not violate international trade regulations by importing its 5¼-in., half-height, double-sided drives into the U.S. in 1984. But Tandon's related $150 million civil lawsuit against Gold Star is still pending in U.S. District Court in Los Angeles.

An attorney for Chatsworth, Calif.-based Tandon said the ITC case had essentially been moot since December 1984 when Gold Star stopped importing the drives in question. But Gold Star spokeswoman Darlene Rabe said the ITC's ruling should help in the federal court case, in which Gold Star has filed counterclaims charging Tandon with abuse of process, antitrust violations, business and contractual interference and unfair competition. "The ITC ruling upholds what has been our position throughout the case," Rabe said.

The case stems from Tandon's allegations that the Gold Star products were based on technology stolen from Tandon by current and former Tandon employees. The employees helped to found now-defunct Format, Inc. of Los Angeles, which manufactured the drives for Gold Star, according to Tandon attorney Raymond Lupo. Tandon also accused some of the Format founders with sabotage and industrial espionage while they worked for Tandon.

The Gold Star case is not related to Tandon's pending cases before the ITC and in federal court against several Japanese disk drive vendors.

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AT&T strong in large user mart, weaker on other fronts

NEW YORK — AT&T has defended and strengthened its hold on the large user long-distance marketplace but has not made significant inroads in other areas, according to a market research firm.

Approximately 1% of the communications company's customers supply AT&T with 40% of its revenue, according to Eastern Management Group of New York. The firm presented its analysis at a recent seminar titled "IBM and AT&T, New Directions, New Technologies," held earlier this month.

Most large customers have experimented with long-distance services from common carriers such as MCI Communications Corp. John Malone, president of Eastern Management, claimed that eight out of every 10 of the Fortune 100 companies have some type of agreement with a carrier other than AT&T.

However, AT&T controls 96% of the market that consists of companies spending $80,000 a month on long-distance calls. "Large companies tested services from vendors like MCI but have returned to the AT&T fold," Malone said. Poor service drove those companies back to AT&T.

Since divestiture, AT&T has entered a number of new markets. The company competes with Digital Equipment Corp. in the minicomputer market, IBM in the personal computer arena, Ungermann-Bass, Inc. in the local-area network niche and foreign telephone companies. However, these moves have done little to increase AT&T's profits, according to Malone.

A better way for AT&T to improve its financial position would be by cutting costs, Malone claimed. A principal area to reduce costs would be in fees paid to former regional operating companies. AT&T is spending close to 60 cents on each long-distance dollar for access charges to the operating companies. "That 60 cents is money disappearing out the back door," Malone noted. If AT&T could bypass the local connection, it would significantly cut costs.

Also, AT&T is paying the operating companies $2 for each bill sent to AT&T customers. "AT&T has to be losing money billing residents who make few long-distance calls," the analyst noted. By taking the billing function in-house, the company could eliminate the $2 charge.

AT&T does not have any avenues for rapid revenue growth. Eastern Management does not think that the private branch exchange market represents a great opportunity. "AT&T has done a better job selling its PBXs this year than in any other year and has increased its market share," he said. "But the rate of growth in the PBX market has declined and will continue to decline."

In 1984, the communications company announced 100 products primarily directed at the computer industry. Despite the slew of introductions, sales from 3B or personal computers accounted for only 3% of AT&T's revenue. Malone estimated that AT&T Information Systems, which delivered most of these products, lost $1.5 billion dollars in 1984.

The analyst concluded by predicting that AT&T will have to sharpen its focus on its communications services and choose a few markets to enter rather than competing on a number of fronts.

— **Paul Korzeniowski**

From page 83

Grants not ready for war

communications company is losing its stranglehold on the long-distance market, which is growing at a rate of only 5% per year. The company could face severe cash-flow problems as it attempts to diversify its business, according to McGill.

AT&T has always been action oriented and would immediately announce products that were technical breakthroughs. In 1984, the communications company launched technically oriented product thrusts rather than marketing-oriented product entries.

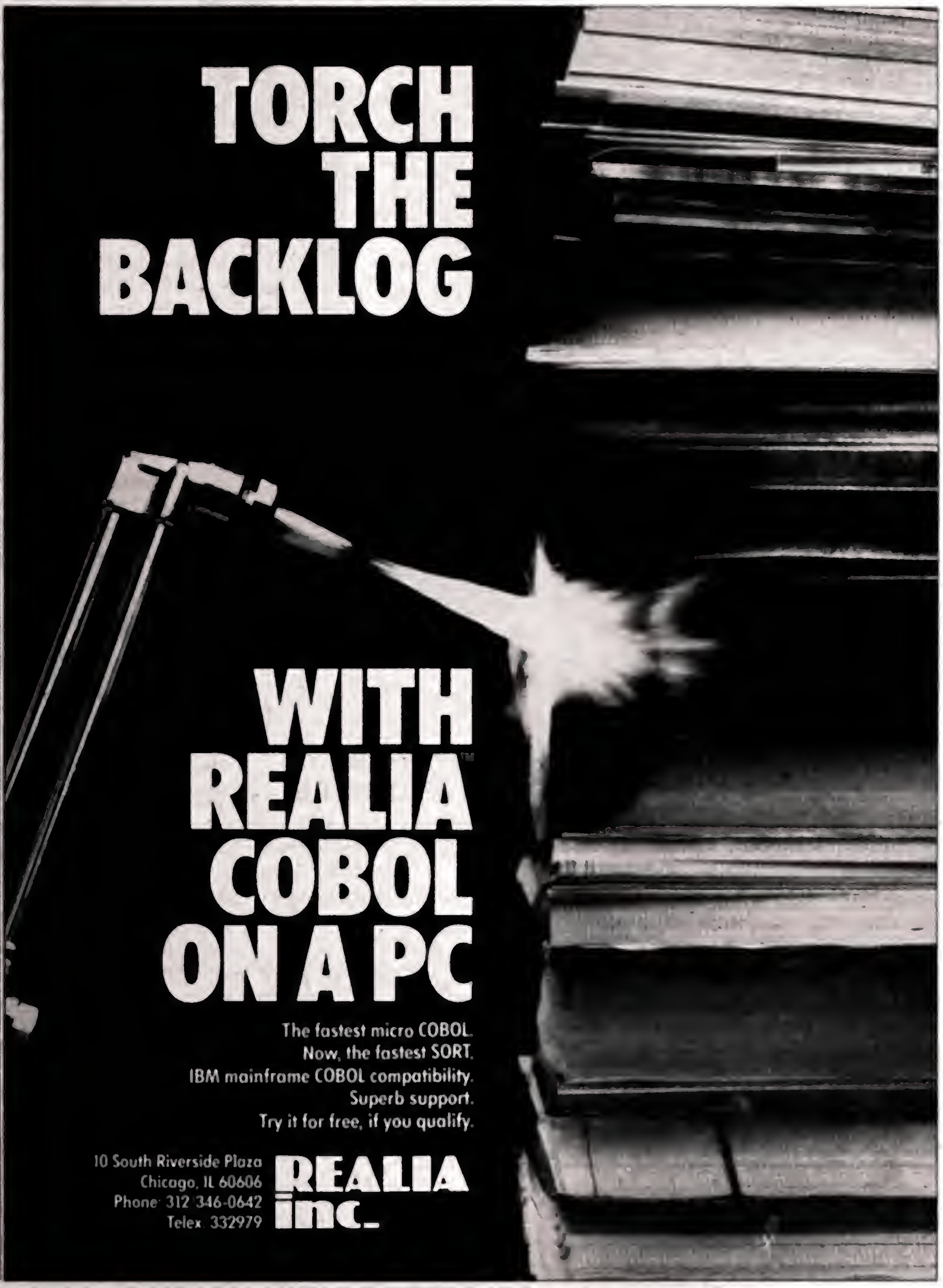
"Technically, the 3B line has some very nice machines," McGill noted. "Its problems are software and AT&T's inability to convince companies to write for the machine."

He said AT&T has saddled each positive step with negative connotations, pointing to the recent layoff of 24,000 employees. "The company knew in 1984 that such a move was needed," he said. "I don't understand why it waited so long to make it."

McGill also classified the AT&T-Ing. C. Olivetti & Co. partnership as a stroke of genius. "AT&T needed an entrance to foreign markets and Olivetti provided it," he said. Even though that was a good move, AT&T has not worked that or other partnerships to the fullest advantage.

McGill echoed the views of other analysts who claimed that AT&T needs an office automation partner like Data General Corp. or Digital Equipment Corp. to make inroads into large corporations.

For either IBM or AT&T to succeed, each must be able to throw away old methods of doings things and quickly adapt to new marketplaces.



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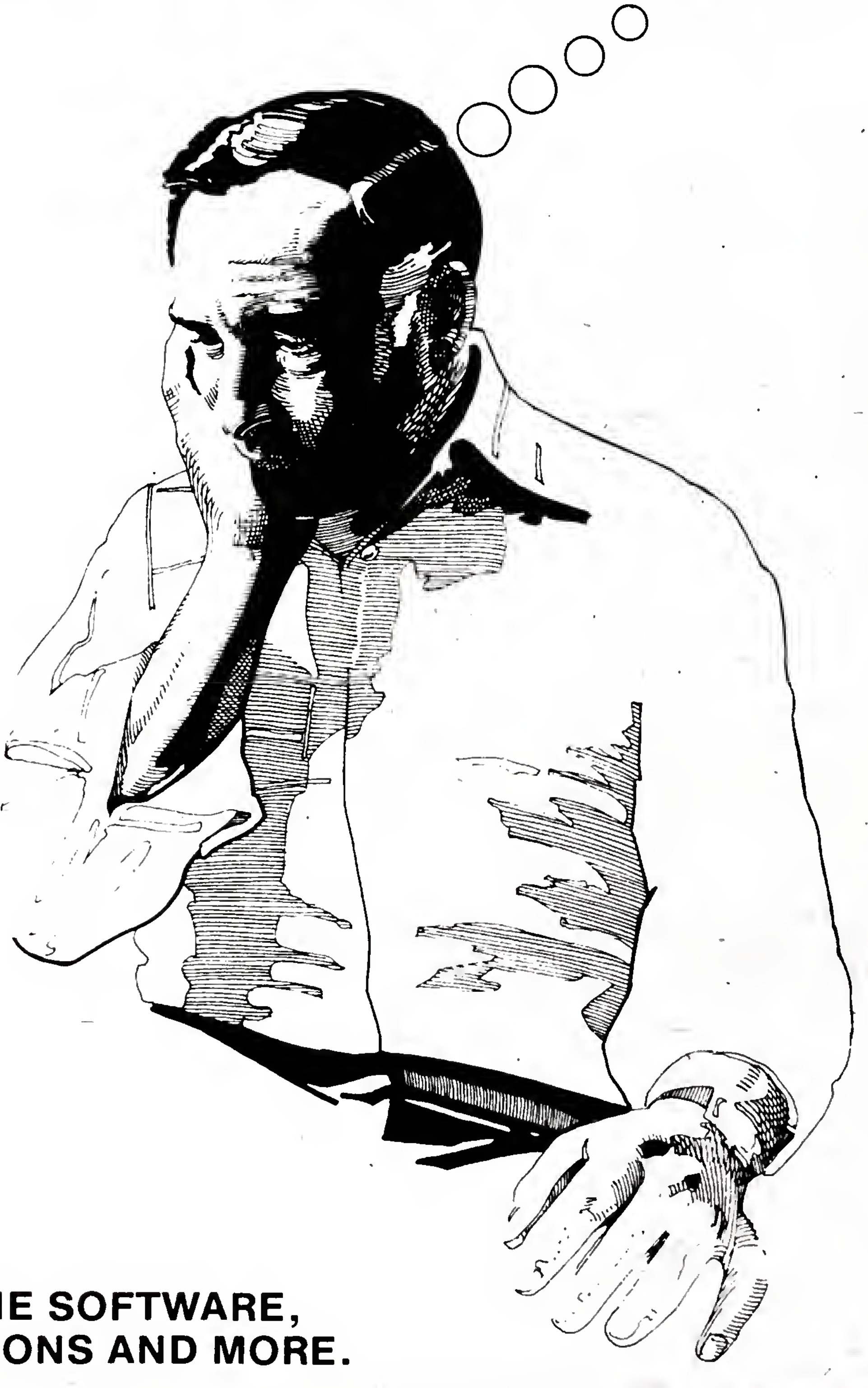

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6A07-01

AMD announces plan to unveil one product per week

By Clinton Wilder

SUNNYVALE, Calif. — In the midst of its first operating loss in 10 years and the continued pessimistic indications for the semiconductor industry, Advanced Micro Devices, Inc. (AMD) recently announced an ambitious scheme to introduce one new product per week during the fiscal year beginning Oct. 1.

The new chips, which would represent roughly twice the number of products AMD introduced in the past year, will include bipolar Cmos and Nmos technologies.

AMD unveiled the plan in conjunction with the announcement of its operating deficit, a $14.4 million pretax loss for the quarter ended June 30. With the loss, AMD became the latest major U.S. chip maker to post an operating loss in the current semiconductor slump, the industry's longest and deepest ever.

After tax credits, AMD was able to post a bottom-line profit of $739,000, or 1 cent per share, for the quarter. Revenue was $150.5 million, a 36% fall from $234.2 million in the same quarter a year ago. AMD earned $38.2 million, or 66 cents per share, in the year-earlier period.

The slackened demand cited by AMD in announcing its results showed little sign of abating in the industry's leading growth indicator, the book: bill ratio. The ratio of new chip orders to shipments in August was .74, up barely from .72 the previous month, but still lower than any other month since February.

The San Jose, Calif.-based Semiconductor Industry Association predicted that semiconductor billings in the third quarter will be down 28% from 1984 levels.

With the worst slump in demand coming in so-called commodity chips, such as 64K-byte random-access memory circuits, AMD is reportedly attempting to move more agressively toward sophisticated, application-specific products in the next 12 months.

"Even with demand down overall, it turns out that you can sell new products," AMD spokesman Elliott Sopkin said. "The computers that are being sold are the ones that have a technology advantage, and those improvements are achieved by technologically advantageous circuits."

One industry analyst expressed skepticism about AMD's product goal. "If you're considering every rerouted gate array a new product, that's one thing," said James Feldhan, vice-president of In-Stat, Inc. in Scottsdale, Ariz. "Their goal gets harder and harder to achieve as applications get more specific. Even a new gate array takes a couple of weeks to run through. But if it's possible, AMD is one of the better companies to try it."

Japanese firm to buy exchanges

By Takehisa Kondoh
Special to CW

TOKYO (CWN) — Daini-Denden, Inc., one of the first Japanese companies to step into direct competition with Nippon Telegraph and Telephone Corp. in the now-private telecommunications marketplace, recently announced it will purchase digital exchange systems in an estimated $10 million deal with Digital Switch Corp. of Richardson, Texas.

Daini-Denden is a group of 225 corporations, led by Kyocera Corp., Sony Corp. and Mitsubishi Corp.

Daini-Denden reportedly made its debut after a series of three telecommunications business laws were enacted in Japan last April, forcing Nippon to go private and withdraw from its decades-old monopoly of domestic telephone and telegraph services.

Open procurement policy

Apparently to soften U.S. complaints about closed markets in Japan for foreign-built telecommunications equipment, Daini-Denden had committed itself to an open procurement policy with which to treat overseas vendors without bias.

Major manufacturers, such as AT&T, Northern Telecom of Canada, NEC Corp. and Fujitsu Ltd., reportedly had vied for a Daini-Denden contract for digitized telephone exchanges.

The two other new telecommunications companies, Japan Telecom Co. and Japan Teleway Co., previously decided to purchase similar equipment from undisclosed Japanese makers.

Contract in the U.S.

In the U.S., according to Digital Switch, the turnkey contract calls for the firm to provide four DEX 600 switching systems and a network control center, as well as training and support.

The contract also provides for options, the company said.

Kondoh is international editor/Asia for CW Network.

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From page 83

‘Fit’ imperative in buy-outs

shares of a high-growth market. Companies with higher shares in growth markets are generally not for sale or are available only at a prohibitive price, he added.

The two most important criteria in evaluating a potential partner's financial future are cash flow/return on investment and earnings per share, Lessler said.

Although Dun & Bradstreet has added handsomely to its bottom line with acquisitions, other firms have been much less successful in their acquisitions. Heading the list of such companies is Control Data Corp., according to George Grodahl, a partner in Broadview Associates, the Fort Lee, N.J., merger consulting firm that conducted the Adapso seminar.

"CDC is the best example that the most important factor in acquisitions is how well you integrate them," Grodahl said. "For years, their acquisitions seemed totally lacking in focus. Now, they've come full circle and have a vice-president of divestitures."

The flurry of recent mergers and acquisitions activity in the software and services industry can be attributed to changing attitudes among entrepreneurs about selling their companies. "More and more often, selling your company means you are still able to run it," according to Gilbert Mintz, a founder of Broadview. "Being acquired has become a sign of success, not failure."

Within that context, however, the seller must realize the fundamental changes inherent in a deal, according to Dataline Corp. President Gerald O'Connell, whose Wilton, Conn., turnkey accounting systems firm was recently acquired by Display Data Corp.

"There is a lot of opportunity on both sides, but remember there is no such thing as a merger," O'Connell said. "The fact is, you have sold your business. Don't be naive about that, or you'll be very disappointed."

Acquisition is rapidly replacing venture capital as the growth mechanism for privately held software and services firms, Broadview's Edward I. Metz said. "Five years ago, the typical start-up strategy was the business plan, three rounds of venture capital and then a public offering," Metz said. "Today, venture capital is much harder to come by, and you see far fewer initial public offerings."

From page 83

Major lessors shun Comlease

pany's annual trade show schedule had been set. Decisions to attend trade shows are often made up to a year in advance, the spokesman said.

According to Bob Bardagy, senior vice-president of marketing at Comdisco, one of the nation's largest independent computer leasing companies, a trade show for leasing was inappropriate for Comdisco. "We do a lot of education seminars on our own, and we don't see the need to throw ourselves into a trade show," he said.

Bardagy added, however, that the show could achieve some success. "It may be a very palatable opportunity for a small leasing company that may not have the ability to get their message across on a national basis, but I would question how many people would travel a long distance to go to something like this."

Dataserv Vice-President Tim Gagner said that although the concept of a leasing show was a good one, his company also passed up Comlease. "It would almost have to be done on a real large scale to make it worth our while," he said.

But scale is of no concern to Tom Martin, president of Computer Financial, Inc. and Comlease chairman. A show like Comlease is necessary, Martin said, because of the changing facets of the computer leasing industry.

"The responsibility for leasing computers traditionally falls within [DP], whereas with other companies, leasing assets are the responsibility of the treasurer. There are a lot of things that users need to know," he said.

Martin said the slim showing of exhibitors could be attributed to the fact it is sometimes difficult to sell services at a trade show. "It's a hard concept to sell an intangible product in a booth," he said.

From page 83

Global-Ultimacc looks ahead

peripherals and owed STC $20 million.

That dependence may not last much longer, Siefert indicated. "At the present time our systems will include STC peripherals, but over time we will be shopping around for other vendors' products that are more competitive or better priced."

Seifert said the transaction added up to $2 million. The management team put up $336,000 for the stock, and STC received about $1.8 million in cash accumulated by Global-Ultimacc as repayment of the debt. "That's roughly five to 10 cents on the dollar, which is a pretty good deal," he said.

"We expect to continue the momentum we had going back in 1983 and 1984 prior to the STC bankruptcy," he said. "The bankruptcy impacted us greatly; there was the perception that we couldn't guarantee we were going to be around."

Joining Siefert in the buy-out were Thomas A. Nagy, executive vice-president of operations; Thomas A. St. John, executive vice-president of sales and marketing; Richard G. Snow Jr., vice-president and general counsel; and William O. Sweeney, vice-president of technology.

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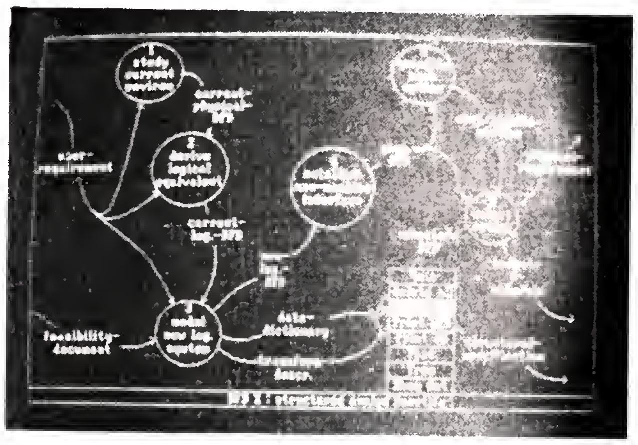

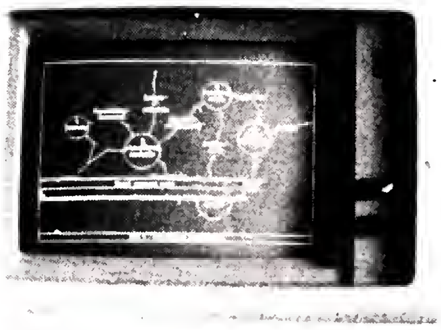

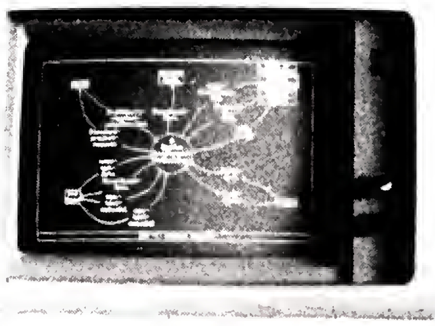

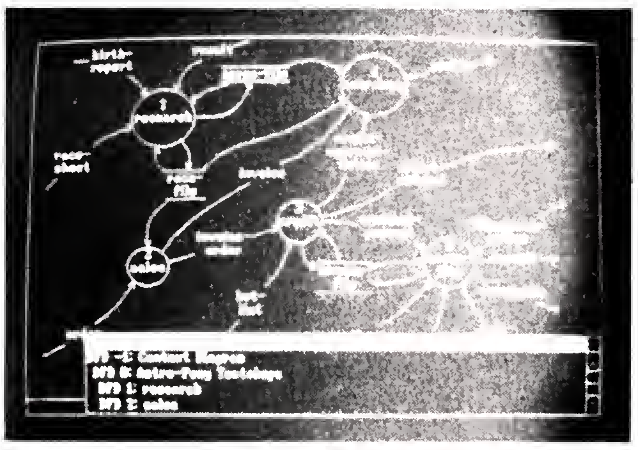

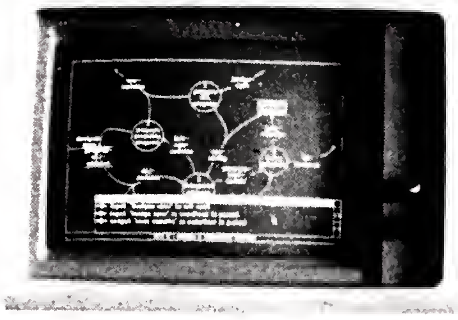

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OEM brings Mitsubishi back to court

By Donna Raimondi

BOSTON — Leading Edge Products, Inc. has again instituted court proceedings against its equipment supplier, Mitsubishi Electronics America, Inc., seeking to recover funds.

Leading Edge, which is an OEM for Mitsubishi products, requested that U.S. District Court find Mitsubishi Electronics in contempt of the court's order originally issued in February and modified Sept. 4. The order requires, in part, that Mitsubishi pay an adjustment to Leading Edge.

The two companies have been battling in the courts since Leading Edge charged Mitsubishi Electronics, a California-based branch of Japanese firm Mitsubishi Corp., with trying to cut off its supply of components in 1984 [CW, Feb. 25]. Mitsubishi was the sole supplier of the major components in Leading Edge microcomputers at the time.

According to a petition filed Sept. 9, Leading Edge charged that Mitsubishi had failed to pay them $638,707 due to a yen adjustment. The adjustment was to offset the higher value of the yen to the U.S. dollar over a period of time.

The adjustment was ordered by the court to be retroactive to Jan. 1, 1984, Leading Edge stated. It further said that Mitsubishi had paid such a yen adjustment to its only other customer, Sperry Corp.

The petition claimed that Mitsubishi offered Leading Edge a yen adjustment effective Feb. 11; that the court-ordered adjustment clearly and unambiguously called for an adjustment retroactive to Jan. 1, 1984; and that Mitsubishi has conditioned payment of any adjustment on a business matter not related to the reason for the yen adjustment.

Returned products reportedly refused

According to Leonard Ross, senior controller for Leading Edge, his company returned some terminals and other products that were not covered under any court-ordered agreement to Mitsubishi, and Mitsubishi refused to accept the returned products. Leading Edge stopped payment on a delivery of other products in order to offset the cost of the returned products, he said. Mitsubishi is using that transaction as a basis for refusing to pay the retroactive yen adjustment to Leading Edge, Ross said.

A lawyer for Mitsubishi in Boston, Zachary Karol, claimed that the Sept. 4 order was a modification of the Feb. 11 order and therefore dealt only with orders subsequent to Feb. 11. Karol said that Mitsubishi never made payment of the amount of Leading Edge's stopped payment a condition of receiving the yen adjustment. He sent a letter to Leading Edge Sept 6. asking for an explanation of why Leading Edge did not pay for the order that it did receive. "I suggested a setoff, but it was never a condition," he added. The response from Leading Edge was the petition to the court, with the letter from Mitsubishi attached to it.

From page 83

Adapso winning Pyrrhic victories?

reliability, currentness or otherwise; and you rely on the program and results solely at your own risk." Microsoft does, however, warrant that the actual disk be free of defects.

This is not picking on Microsoft, because the disclaimer is pretty standard on microcomputer software packaging.

Furthermore, the point of this column is not to further berate such antiuser disclaimers, but rather to point out to software developers the brazen double standard they are holding customers to.

Adapso has been in the forefront of efforts to combat the evil empire of software piracy. Don't be naughty, the organization tells users — any time you copy a program, you are stealing money from the developer, or, as in most cases, the company that bought the rights to the program from the developer.

Adapso has weighed in heavily on the immoral and illegal aspects of denying vendors their pound of flesh for overpriced software packages that too often are "me-too" products that really are approaching commodity status in terms of originality and usefulness.

Yet this same organization that wants users to hold the high moral ground hypocritically denies those same users any guarantee that the goods they are buying actually work and live up to company claims.

Let's go back to the disclaimer cited above: "Microsoft does not . . . make any representations regarding the use of or the results of the use of the program . . ." That is pure bull! Microsoft and every other vendor that buys advertising in no uncertain terms make representations regarding what their products will do, why they are better than other products and so on.

So, before Adapso gets carried away on this victory, maybe it had just better sit back and think about what it is willing to give users in exchange for what it wants from users. Perhaps Adapso members should point out in their disclaimers what states actually prohibit such claims. And maybe — I admit this is really a radical proposition — just maybe there are some leading vendors out there with the guts to actually back up marketing claims and promise users a full refund or replacement in the event of any dissatisfaction.

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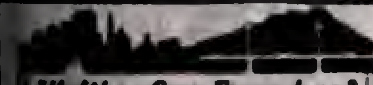

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Department 4SFT

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Computer Specialist
Dunhill of Anderson, Inc.
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Anderson, South Carolina 29622
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NYC Department of Correction
225 Broadway
Personnel Division
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Programmer/Analyst Supervisor for an IBM System 38 shop with 9 programmers. Position will be responsible for schedule development and project assignment and supervision. Progressive county government environment with maintenance, design, and development activities in a local/remote setting. Degree desired with et least 4 years of data processing experience including a minimum of 1 year supervisory experience. Salary negotiable (currently $31,600), plus liberal fringe benefits. Send resume to: Jackson County Administrative Office, Jackson County Courthouse, Room 214, Medford, OR 97501, by October 11, 1985.

PL1 - BAL
COBOL/CICS
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PROGRAMMERS/ ANALYSTS

Exciting Changes are Taking Place at Eastern

Four successive profitable quarters, employee ownership, international route expansion, and new salary structures for data processing personnel are just a few of the exciting changes taking place at Eastern.

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PL/1 & ASSEMBLER APPLICATION PROGRAMMERS

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Current openings are available to top level professionals to broaden your base of expertise while working on diverse projects for military logistics, satellite command and control and integrated systems.

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From initial definition of requirements through physical implementation, your expertise will guide the database design process. After deriving requirements from functional specifications, flow diagrams and related materials, you'll provide logical and physical database models. Proven ability in this area a must. Your control and documentation of all phases will ensure the implemented database design meets our high standards for performance, reliability and integrity.

Ten years computer data systems development experience, including 6 or more years involvement with various phases of large database design required, along with a BA/BS in Computer Science, Math, Physics, Engineering or related discipline. MSCS preferred. Working knowledge of structured, top-down methodologies (Yourdon, Gane, and Sarson, etc.), normalization/optimization and/or tuning of database structures highly desirable. Database design work in a distributed systems environment a plus.

Senior Systems Analyst

You'll define requirements for large data systems based on analyses of customer documentation and information obtained through interviews. Outlining various architectural components (with an emphasis on software) and allocating requirements will be key. This involves developing functional descriptions, data flow and component block diagrams, and interface control documentation. Requires 10-12 years computer software systems development experience, including 4 years of requirements analysis and large data systems design. BA/BS in Computer Science, Physics, Math, Engineering or related discipline required. MSCS preferred. USAF/DOO systems design/development expertise desirable. Familiarity with MILSTD 490/483 a plus.

Data Systems Modernization

The upgrade of the Satellite Control Facility through Data Systems Modernization (DSM) which incorporates DSM-Transition and Sustaining Engineering, is a project that requires the expertise of quality professionals who are skilled in systems analysis, specifications development and application programming with real-time command/control systems.

Senior Systems Analyst

Team Leader in systems development to support software design, software development practices and software management. Responsible for the software functions of a real-time interactive command and control system, to include transition, integration and requirements analysis.

Responsibilities include the investigation and analysis of operational software support; providing plans for development and design of software; reviewing modifications for implementation and integration; the validation of satellite support requirements for space systems; developing operations concepts; and supporting PDRs and CDRs. You will also be responsible for system operations support, training, and will support test and validation and hardware interface analysis.

Requires BS in Computer Science, Math or Physics; 12-15 years technical and administrative management experience; and knowledge of AFSCF/DSM operations.

Systems Analyst

A Team Leader responsible for real-time system definition and design for Commanding and Telemetry. Perform detailed technical analysis addressing satellite operations software support. Responsible for system architecture, system concepts and improvements. You will be involved in software requirements definitions; software design description; software development planning; engineering change proposals; and design reviews and network modifications.

The position requires a BS in Computer Science, Math or Physics, 8 years experience in operational analysis, studies and requirements, and knowledge of AFSCF/DSM operations.

In addition to real opportunities for career growth and exciting technical challenge, we offer competitive salaries and an excellent benefits program. Please send your resume with salary requirements to Kim Putbrese, Litton Mellonics, P.O. Box 3407, Sunnyvale, CA 94088-3407. U.S. citizenship required for most positions. Mellonics is an equal opportunity employer.

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Provides technical support for a DEC VAX 11/750 computer system. Maintains VMS operating systems, analyzes performance, configures system, installs software, develops procedures, and administers system. Assist users at various levels in making maximum use of the system. Will have some responsibility for the Fund-Raising Information System. Experience with hardware and data communications desirable.

Requires Bachelor's Degree and 1-2 years of experience with BASIC and VAX/VMS, evidence of strong analytical skills and ability to communicate effectively orally and in writing.

Please send resume and salary requirements to
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Primary responsibilities will include:

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- Technical administration of corporate data security procedures and techniques in support of MVS, VM/CMS, CICS, IDMS.
- Implementation, maintenance and testing of the corporate disaster recovery program.

Primary experience should include: ACF2 Data Security, OS/JCL and OS Utilities; TSO/SPF, and ROSCOE, IBM PC's, M&D Millenium, SDSF, RUSCO Access System, and Telecommunications.

Mail resume and salary requirements to the Employee Relations Department, or call 214-754-1171. Principals only please.

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Currently recruiting experienced computer pros with background in any of the following: IBM COBOL Mainframe applications; Macro or Command CICS; VM/CMS applications development; IDMS P/A; Operations Analyst; POS applications with IBM Mainframe exper; DEC VAX Systems Mgmt; Data Base Analysts and Specialists; MVS or VM systems programming; NOMAD DB Analysts; Datacom or Network Software; Software Engineering. Partial listing of fee paid positions. Call or write:

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PROJECT LEADER – SCIENTIFIC

The Cleveland Clinic Foundation, internationally respected for its dedication to excellence in research, education, and patient care, has a challenging opportunity for an experienced Project Leader.

The successful applicant will be responsible for supervising the group, performing shared system management functions for a VAX 11/785, troubleshooting hardware and software problems and on-going user support.

Qualified candidates will have advanced VAX system management experience (large VMS system) and excellent working knowledge of FORTRAN, BASIC, and VAX-DATATRIEVE, knowledge of statistical packages (SAS, SPSS-X, BMDP, SIR) and excellent oral and written communications skills.

We offer a dynamic work environment, competitive compensation and outstanding benefit program, including 33 days paid time off per year, Sport Facility, Tuition Assistance and much more.

Qualified candidates send resume to **Jennifer Popowicz, Recruiter, Cleveland Clinic Foundation, 9500 Euclid Ave., Cleveland, OH 44106.**

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For several immediate positions, steel industry experience will be helpful.

PROJECT MANAGER

You will manage the development, implementation and start-up of factory automation/process control projects. Our large integrated systems projects require practiced management skills, coupled with depth in control systems technology. A BS degree and 7+ years' experience in the development of real-time control systems is required.

These positions offer technical challenge, competitive salary and excellent benefits. For immediate consideration, please send your resume and salary history in complete confidence or call 412/566-4650 for additional information.

Human Resources
Department CW-923

DRAVO ENGINEERS, INC.
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Programming

Data Base Applications Programmers

Martin Marietta
Aerospace
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Dynamic aerospace company has immediate opportunities for Database Programmers who have the ability to design and develop on-line database Management Information Systems. Must have a minimum of five years experience in IMS database design, programming and support. Must have strong COBOL and IBM 370JCL abilities. Should have fourth generation language and PC programming experience desirable.

For immediate consideration for these challenging opportunities, send resume in confidence to:
Staffing, Dept. CW09235, Shirley Whitcamp, Martin Marietta Aerospace, P.O. Box 1681, Vandenberg AFB, CA 93437.

This position is available at our Vandenberg Operation; other exciting opportunities exist at our Baltimore, Denver, New Orleans and Orlando facilities. Proof of U.S. Citizenship required. An affirmative action/equal opportunity employer.

MARTIN MARIETTA

Data Processing Manager

Chicago based financial services organization has an exceptional opportunity for a data processing manager with experience in COBOL programming and systems design with a DEC VAX. Qualified candidate will have a BS Degree, at least 6 years experience with a minimum of 2 years in a significant managerial capacity. Responsibilities will include reorganizing the department, working with management to develop departmental goals and objectives, and for the development and implementation of plans which will assure the attainment of those goals and objectives. For details, please send resume to

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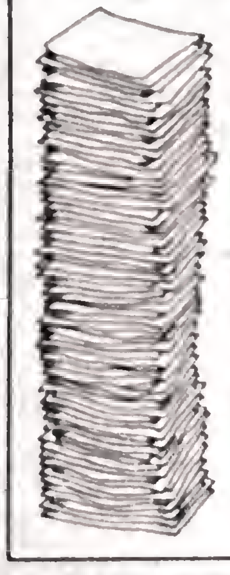

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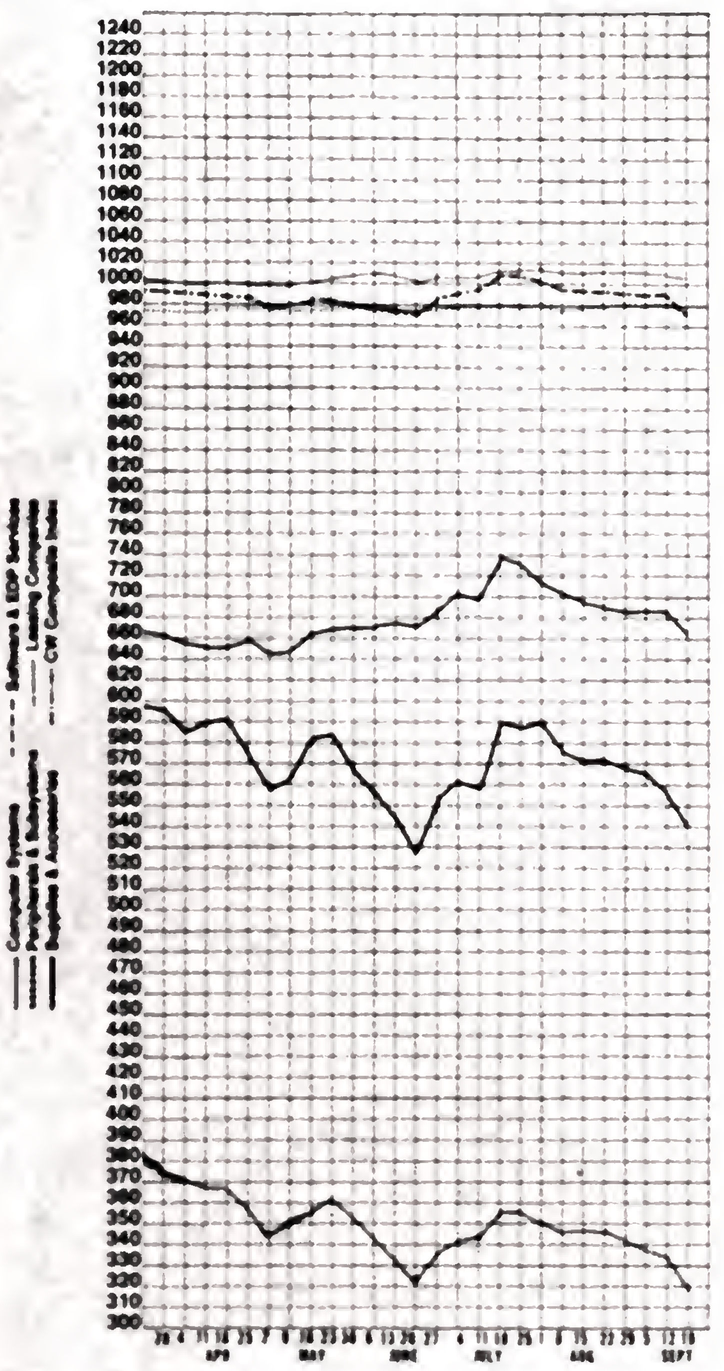
Computerworld Stock Trading Index



Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE QUOTES INC Cambridge Mass. 02139

CLOSING PRICES WEDNESDAY, SEPTEMBER 18, 1985

EXCH		1985 RANGE (1)	CLOSE SEP 18 1985	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	LEASING COMPANIES				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	COMPONENTS				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	SOFTWARE & EDP SERVICES				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	PERIPHERALS & SUBSYSTEMS				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	SUPPLIES & ACCESSORIES				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON;
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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